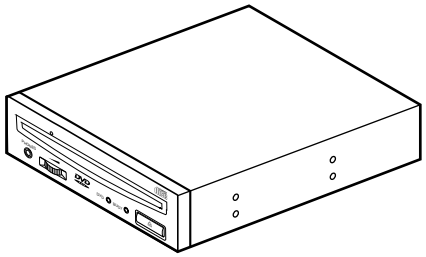
Service Manual

PIONEER®
The Art of Entertainment



ORDER NO.
RRV1901

DVD-ROM DRIVE UNIT

DVD-102
DVD-A02

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model		Power Requirement	Remarks
	DVD -102	DVD -A02		
ZUCYV/WL	○	○	DC power supplied from other system component	

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1. SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

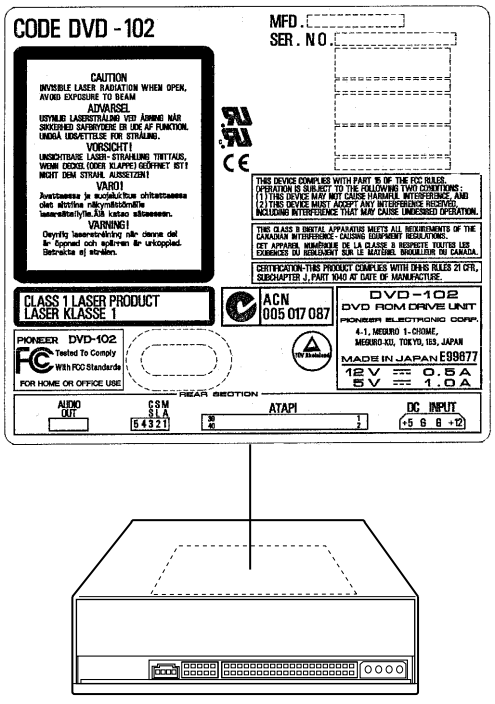
WARNING
Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).
When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

IMPORTANT
THIS PIONEER APPARATUS CONTAINS LASER OF CLASS 1.
SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUTED PERSON.

LASER DIODE CHARACTERISTICS
MAXIMUM OUTPUT POWER: 7 mw
WAVELENGTH: 640 nm , 780 nm

LABEL CHECK

DRW1885



Rear View

Additional Laser Caution

1. Laser Interlock Mechanism
   The position of the switch (S601) for detecting loading completion is detected by the system microprocessor, and the design prevents laser diode oscillation when the switch is not in $\overline{\text{LPS1}}$ terminal side (when the mechanism is not clamped and $\overline{\text{LPS1}}$ signal is high level.) Thus, the interlock will no longer function if the switch is deliberately set to $\overline{\text{LPS1}}$ terminal side. (if $\overline{\text{LPS1}}$ signal is low level).
   In the test mode* the interlock mechanism will not function.
   Laser diode oscillation will continue, if pin 19 or 20 of µPC2510 (IC50) on the MAIN board assy connected to high level, or else the terminals of Q50 or Q51 are shorted to each other .

2. When the cover is opened, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 laser beam.

* Refer to page 23.

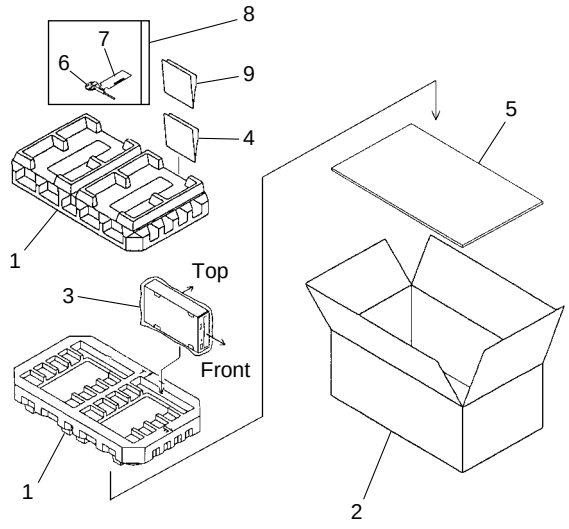
This product complies with the EMC Directives (89/336/EEC, 92/31/EEC) and CE Marking Directive (93/68/EEC).

2. EXPLODED VIEWS AND PARTS LIST

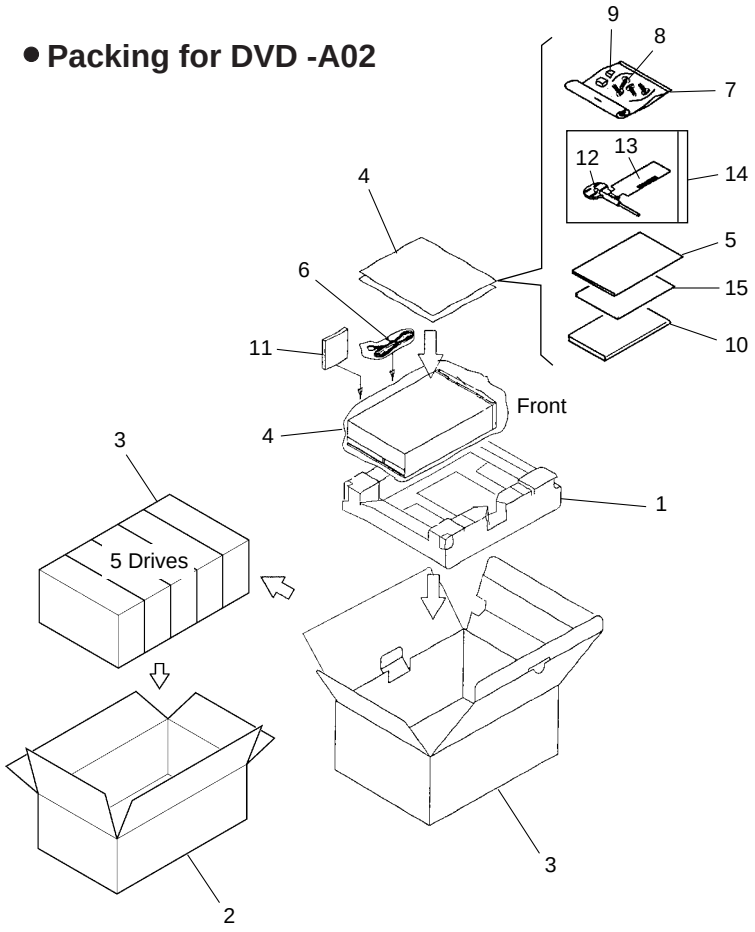
NOTES :
- *Parts marked by " NSP " are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Screw adjacent to ▼ mark on the product are used for disassembly.*

2.1 PACKING

● Packing for DVD -102



● Packing for DVD -A02



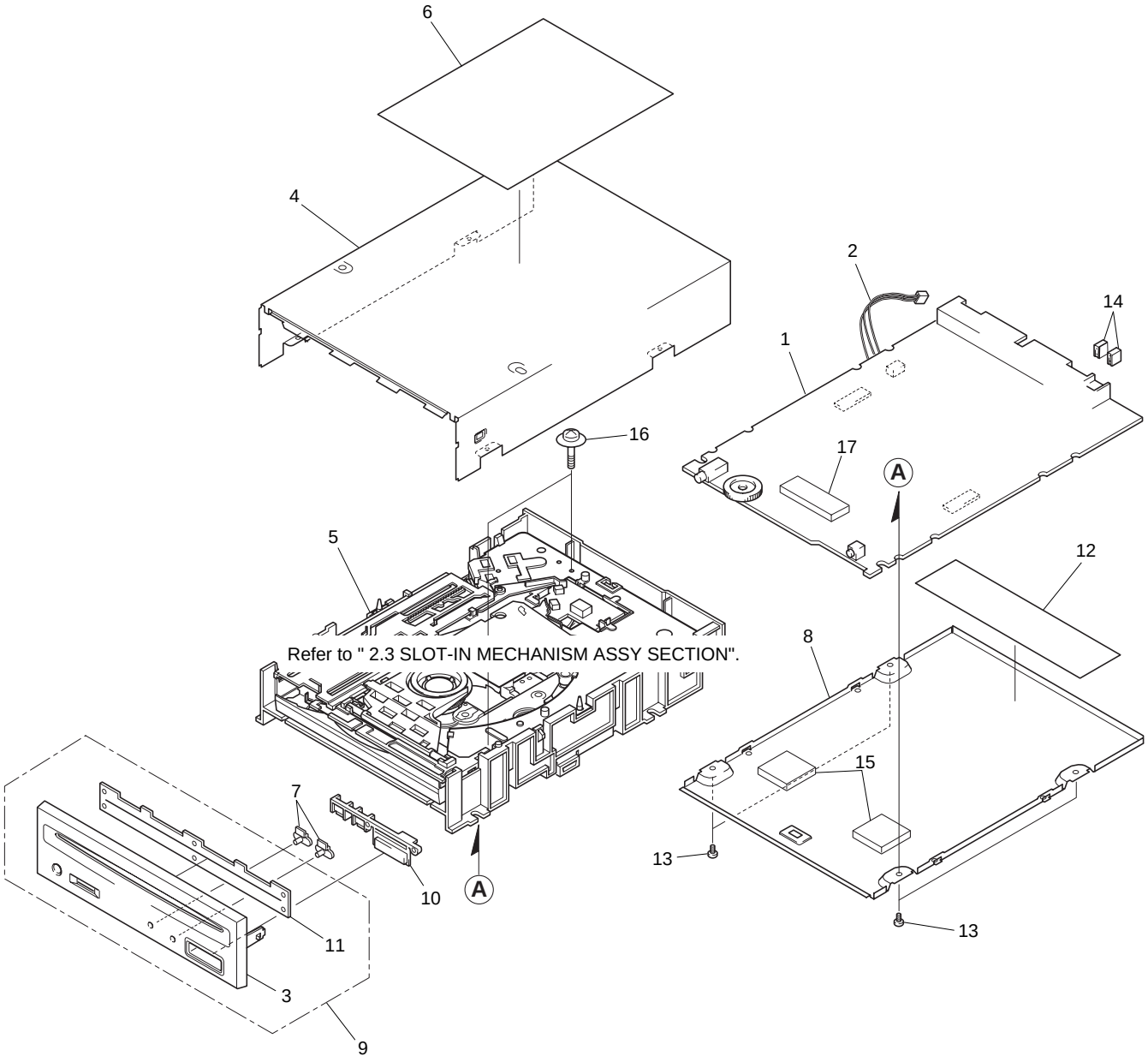
● Parts List for DVD-102

Mark	No.	Description	Part No.
	1	Pad (Bulk)	DHA1402
	2	Packing Case	DHG1804
NSP	3	Polyethylene Bag (235X320)	Z21-018
	4	Operating Instructions (English/ French/ German)	DRC1068
	5	Plate	DHC1048
	6	Push Rod	DEX1007
	7	CAUTION Tag	DRW1881
NSP	8	Polyethylene Bag (75X120)	Z21-006
	9	Caution Paper	DRM1212

● Parts List for DVD-A02

Mark	No.	Description	Part No.
	1	Pad (Pulp)	DHA1369
	2	Master Carton	DHG1823
	3	Packing Case	DHG1824
NSP	4	Polyethylene Bag (235X320)	Z21-019
	5	Operating Instructions (English/ French/ German Italian)	DRC1074
	6	Audio Cable	DKP3369
	7	Polyethylene Bag(70X100)	DHL1089
	8	Screw	AMZ30P060FMC
	9	Short Socket	DKX1042
	10	Install Manual	DRB1225
	11	Programmed FD (ATAPI)	DWX1808
	12	Push Rod	DEX1007
	13	CAUTION Tag	DRW1881
NSP	14	Polyethylene Bag (75X120)	Z21-006
	15	Caution Paper	DRM1212

2.2 EXTERIOR

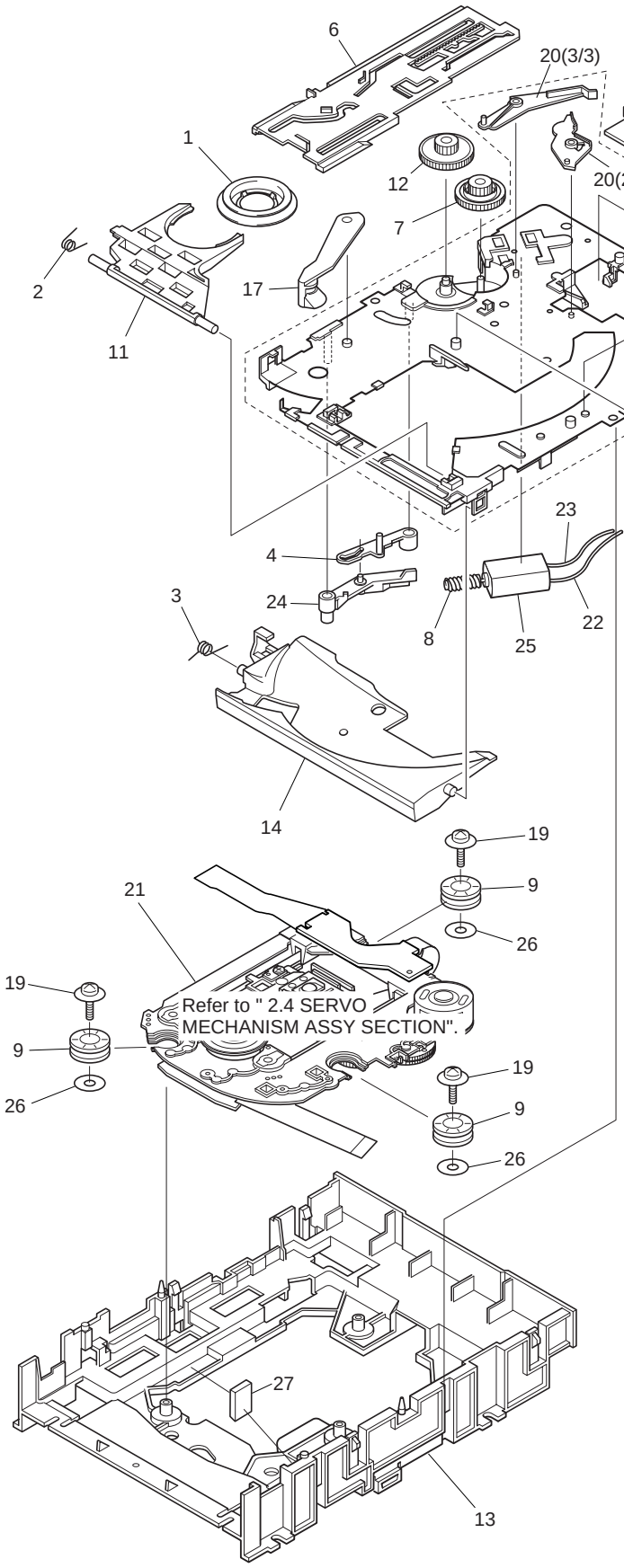


● EXTERIOR PARTS LIST

Mark	No.	Description	Part No.
	1	MAIN BOARD ASSY	DWX1854
NSP	2	CONNECTOR ASSY 3P	DKP3377
	3	FRONT VESSEL ASSY (For DVD-102)	DAH1861
	3	FRONT VESSEL ASSY (For DVD-A02)	DAH1864
NSP	4	TOP CASE	DNC1470
	5	SLOT IN MECHA ASSY-S	DXX2410
NSP	6	LABEL	DRW1885
	7	LENS	DAC1855
NSP	8	BOTTOM CASE	DNC1477
	9	FRONT VESSEL ASSY-S (For DVD-102)	DEA1010
	9	FRONT VESSEL ASSY-S (For DVD-A02)	DEA1016

Mark	No.	Description	Part No.
	10	CONTROL BUTTON	DAC1884
NSP	11	FTONT SHEET	DED1126
	12	65 LABEL	DRW1659
	13	SCREW	BBZ26P080FMC
	14	SHORT SOCKET	DKX1042
NSP	15	SILICON SEAT	DEB1380
	16	SCREW	BPZ20P100FMC
	17	SPACER	DEB1392

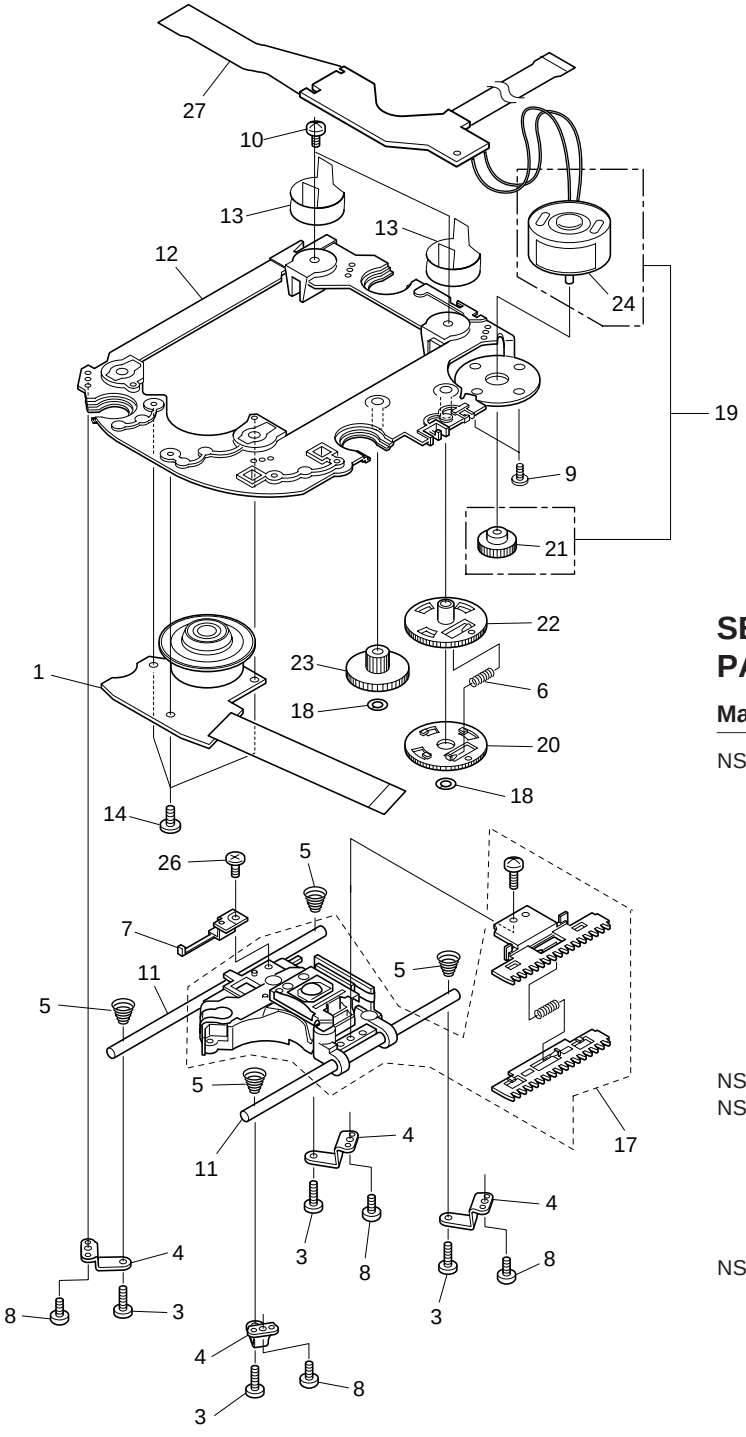
2.3 SLOT IN MECHANISM ASSY SECTION



● SLOT IN MECHANISM ASSY SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	CLAMPER ASSY	DXA1821
	2	CLAMP SPRING	DBH1374
	3	GUIDE SPRING	DBH1375
	4	LEVER (1)	DNK3402
	5	SL MECHA BOARD ASSY	DWX1796
	6	MAIN CAM	DNK3407
	7	LOADING GEAR	DNK3409
NSP	8	WORM GEAR	DNK3410
	9	FLOATING RUBBER	DEB1379
	10	EARTH SPRING	DBH1398
	11	CLAMP ARM	DNK3404
	12	DRIVE GEAR	DNK3408
	13	CHASSIS D	DNK3479
	14	DISK GUIDE	DNK3478
	15	.....	
	16	EJECT LEVER	DNK3405
	17	LOADING LEVER	DNK3406
	18	SCREW	ABZ26P050FMC
	19	FLOAT FASTENER	DBA1110
NSP	20	LOADING BASE	DNK3494
	21	SERVO MECHANISM ASSY-S	DXX2413
	22	MOTOR LEAD WIRER (Red)	DDB1078
	23	MOTOR LEAD WIRER (Black)	DDB1079
NSP	24	LEVER (2)	DNK3403
NSP	25	DC MOTOR	DXM1093
	26	POLYSYEN WASHER	DEC2213
	27	SPACER	DEB1392

2.4 SERVO MECHANISM ASSY SECTION



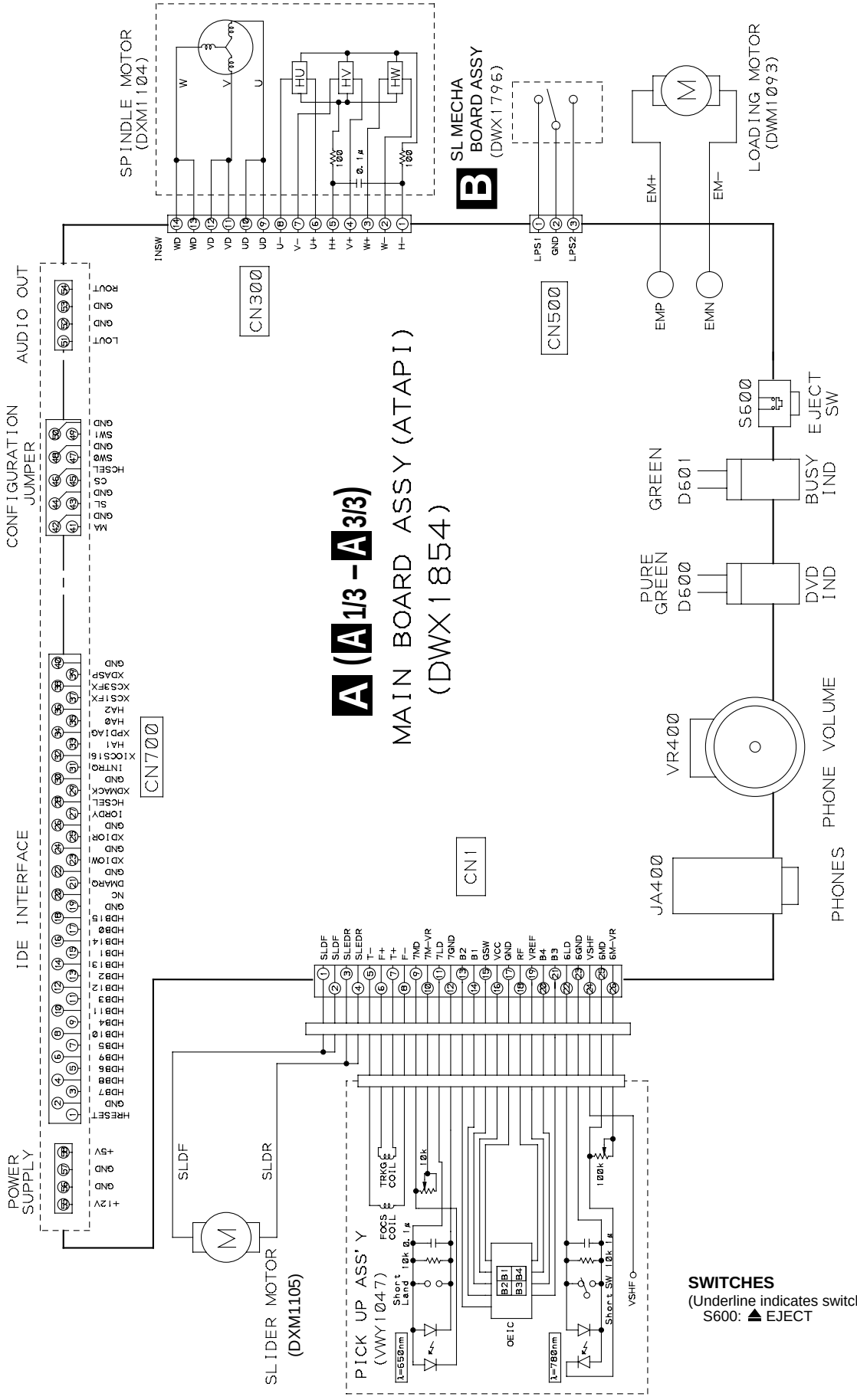
SERVO MECHANISM ASSY SECTION PARTS LIST

Mark	No.	Description	Part No.
NSP	1	SPINDLE MOTOR ASSY	DXM1104
	2	.....	
	3	SKEW SCREW	DBA1111
	4	SKEW STAR	DNH2304
	5	SKEW SPRING	DBH1401
	6	GEAR SPRING	DBH1400
	7	SLIDER ASSY	DXA1836
	8	SCREW	PMZ26P040FMC
	9	SCREW	JGZ17P028FMC
	10	SCREW	PPZ20P040FMC
NSP	11	GUIDE BAR	DLA1838
NSP	12	MECHANISM BASE	DNK3483
	13	FPC HOLDER	DNK3506
	14	SCREW	BPZ20P060FMC
	15	.....	
	16	.....	
NSP	17	PICKUP ASSY	VWY1047
	18	WASHER	WT21D050D025
	19	MOTOR ASSY	GXM1001
	20	GEAR C	DNK3486
	21	GEAR D	DNK3487
	22	GEAR B	DNK3485
	23	GEAR A	DNK3484
	24	SLIDER MOTOR	DXM1105
	25	.....	
	26	SCREW	VBA1051
	27	FLEXIBLE CABLE PU (20P)	DNP1849

3. SCHEMATIC DIAGRAM

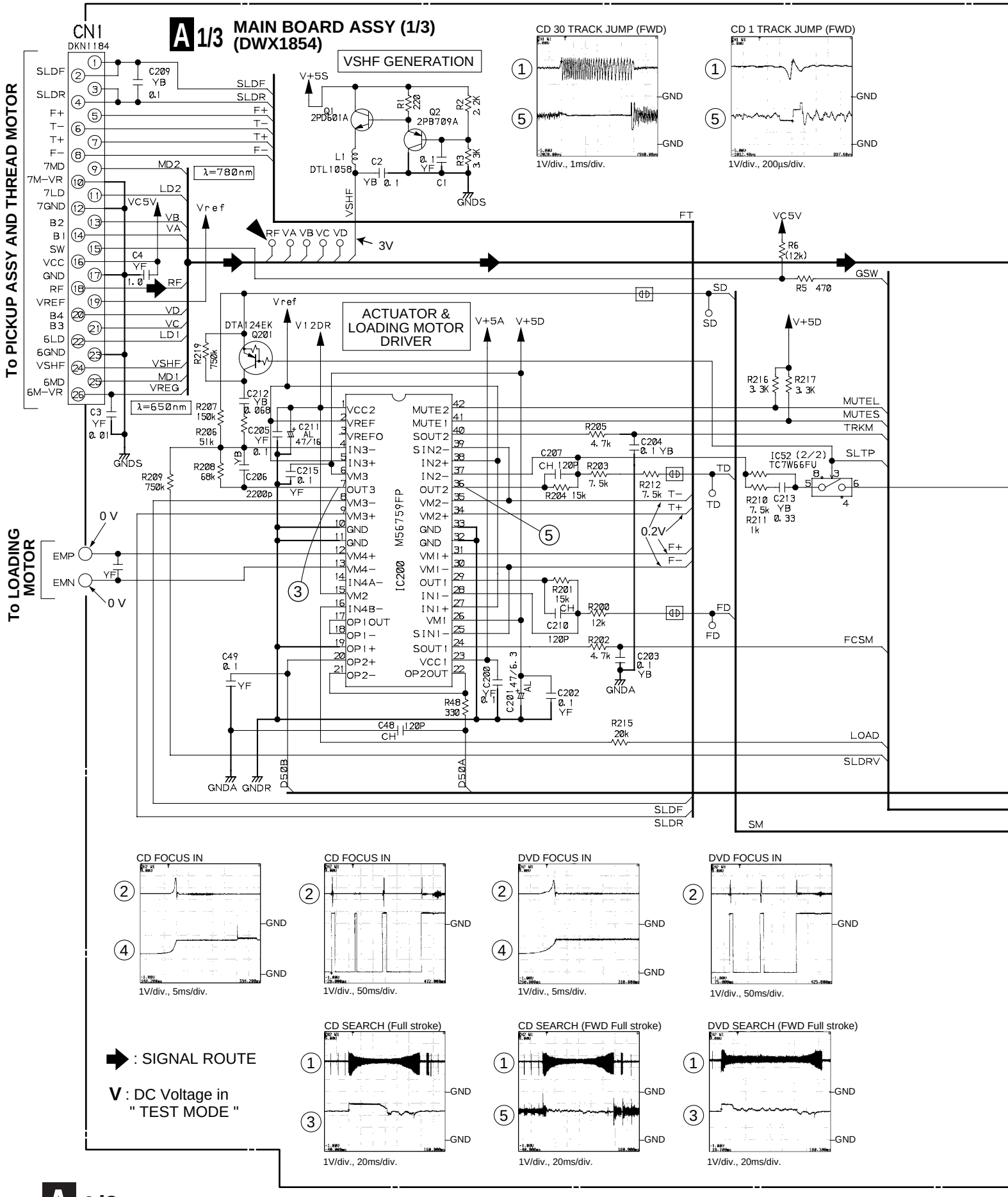
Note : When ordering service parts, be sure to refer to "EXPLODED VIEWS and PARTS LIST" or "PCB PARTS LIST".

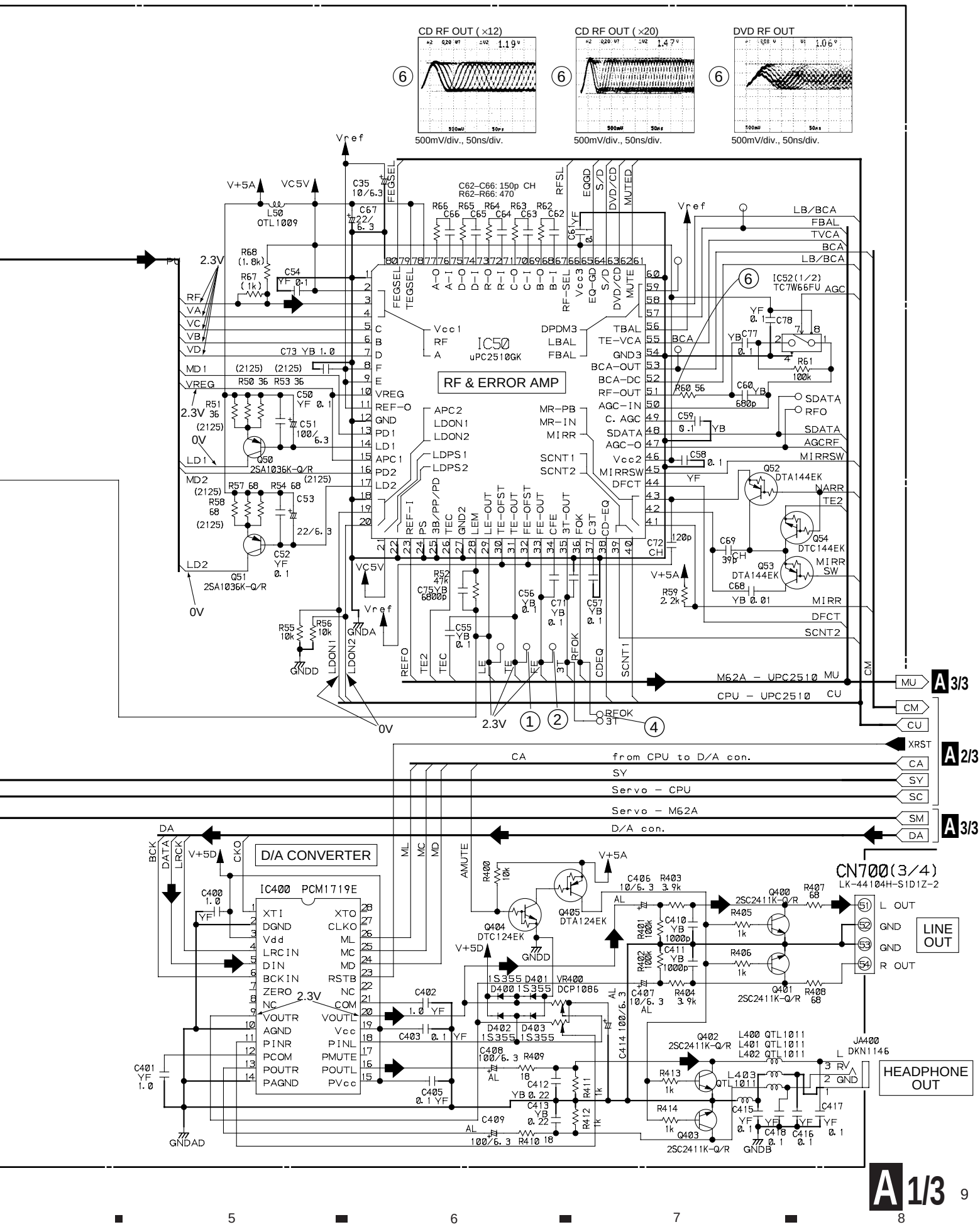
3.1 OVERALL SCHEMATIC DIAGRAM



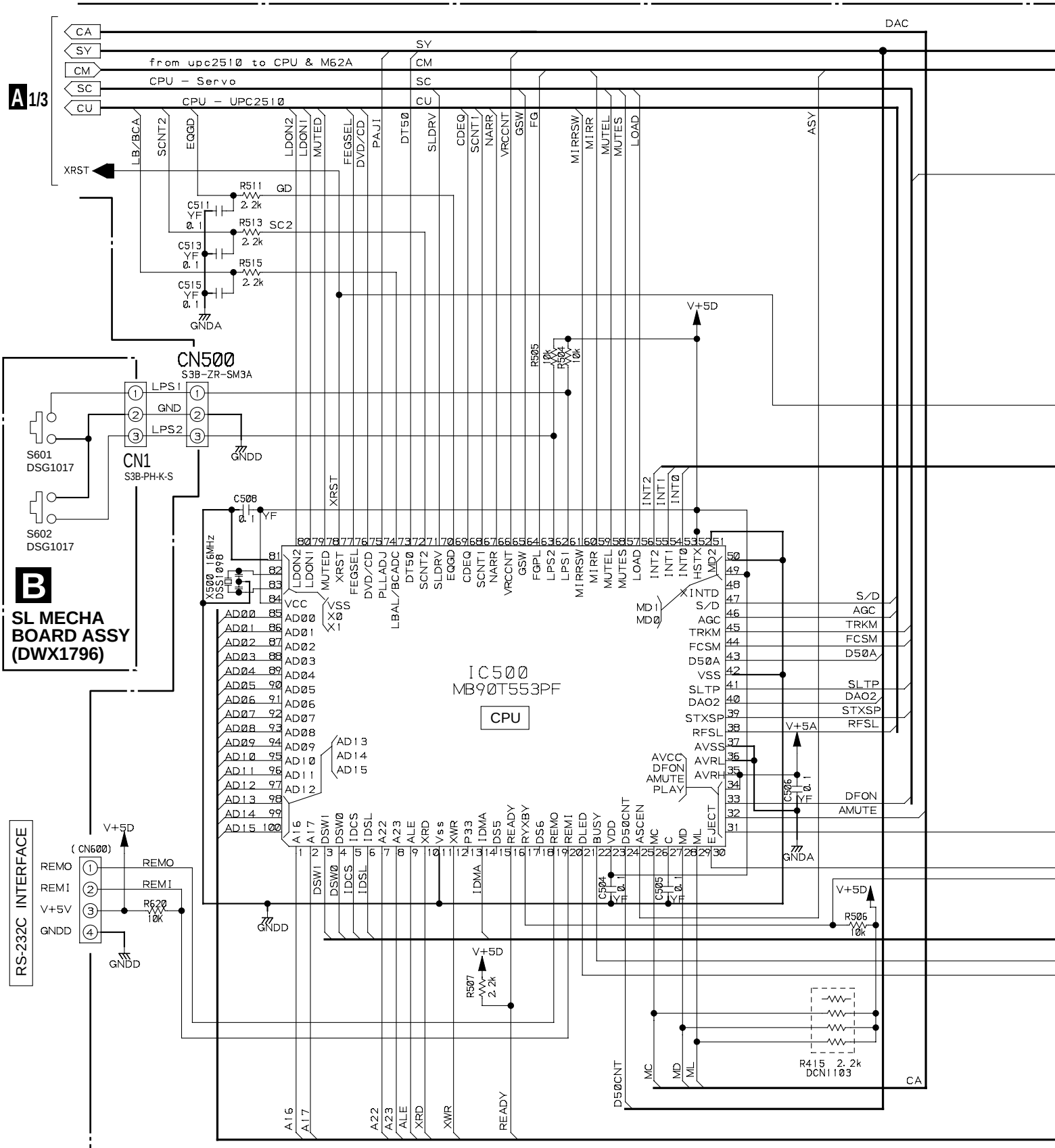
SWITCHES
(Underline indicates switch position):
S600: ▲ EJECT

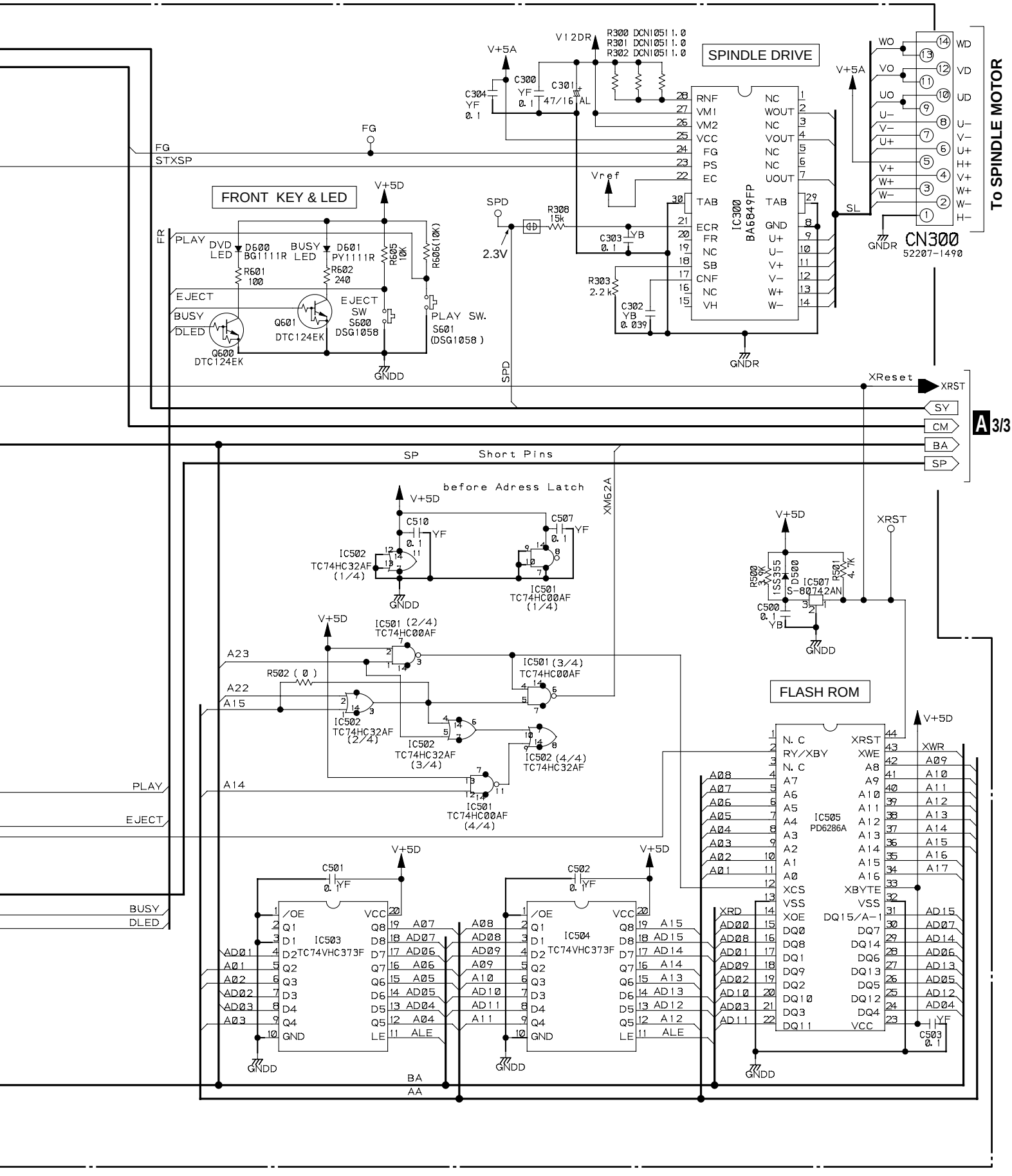
3.2 MAIN BOARD ASSY (ATAPI) (1/3)



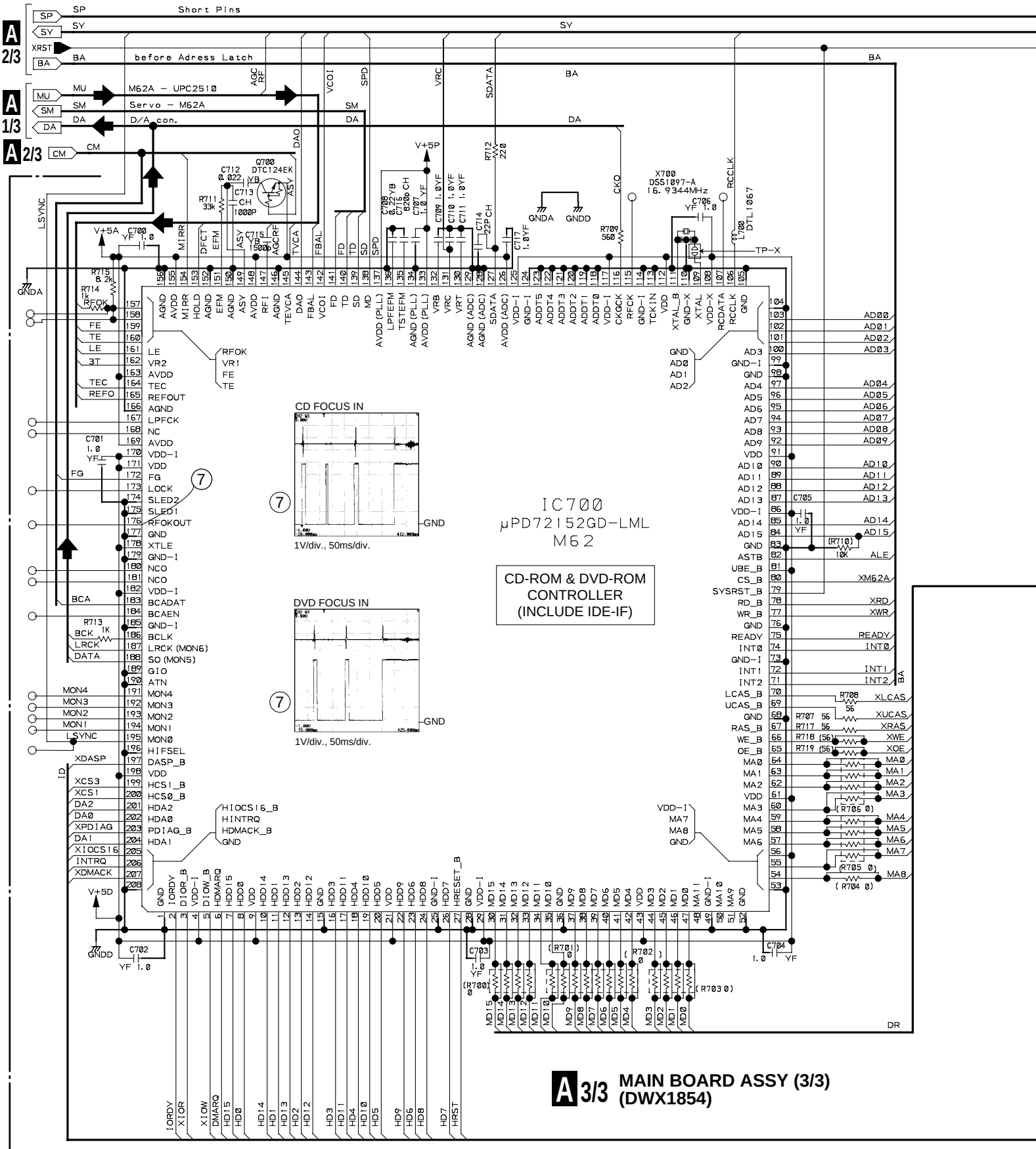

CD RF OUT (×12)
CD RF OUT (×20)
DVD RF OUT
500mV/div., 50ns/div.
500mV/div., 50ns/div.
500mV/div., 50ns/div.
RF & ERROR AMP
IC50
uPC2510GK
D/A CONVERTER
IC400 PCM1719E
CN700(3/4)
LK-44104H-S1D1Z-2
LINE OUT
HEADPHONE OUT
JA400
DKN1146
M62A – UPC2510 MU
CPU – UPC2510 CU
from CPU to D/A con.
Servo – CPU
Servo – M62A
D/A con.
A 3/3
A 2/3
A 1/3

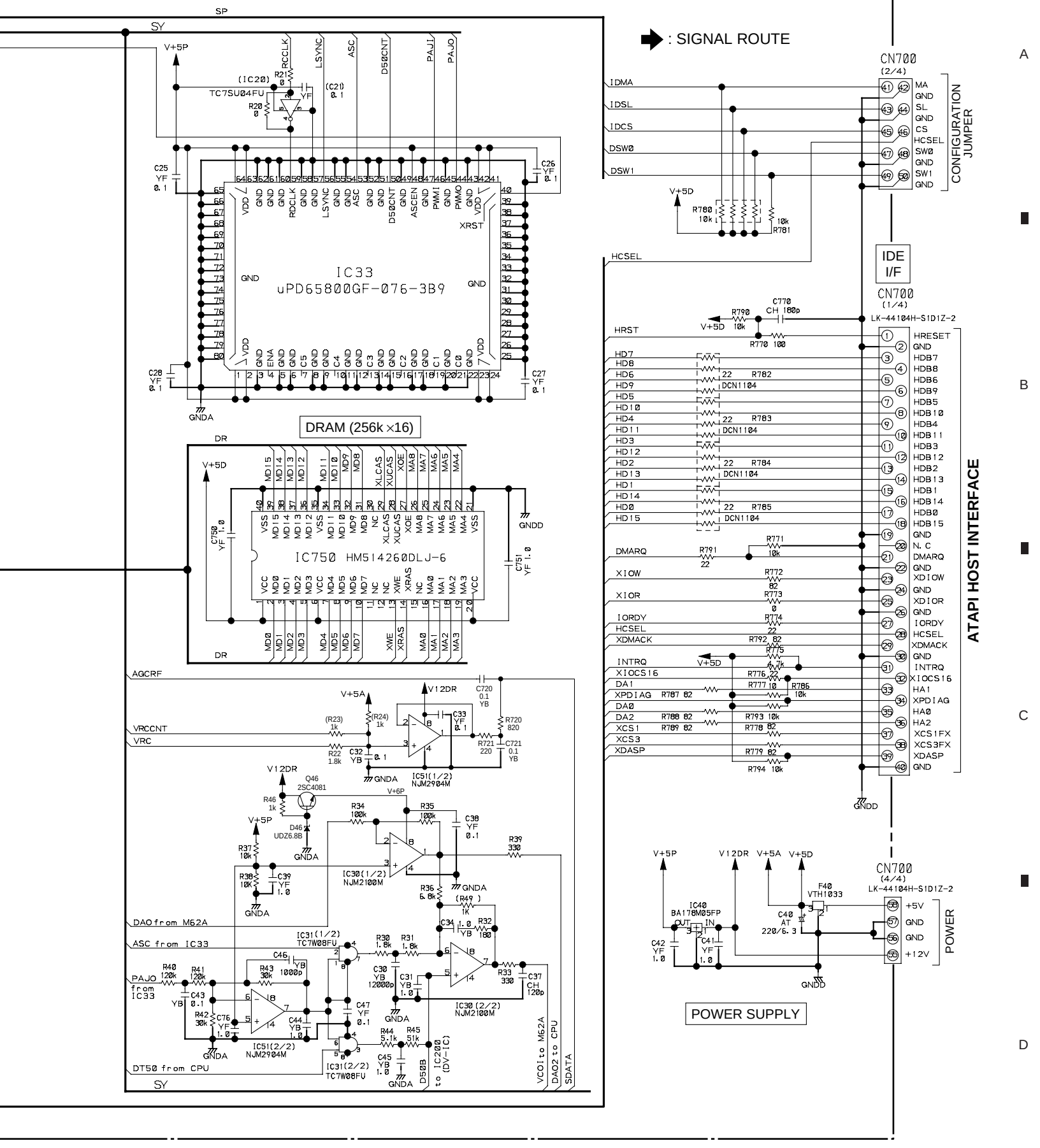
3.3 MAIN BOARD ASSY (ATAPI) (2/3) AND SL MECHA BOARD ASSY




SPINDLE DRIVE
IC300 BA6849FP
CN300 52207-1490
To SPINDLE MOTOR
FRONT KEY & LED
FLASH ROM
IC505 PD6286A
IC503 TC74VHC373F
IC504 TC74VHC373F
IC502 TC74HC32AF
IC501 TC74HC00AF
IC507 S-80742AN
Short Pins
before Adress Latch
A 3/3
A 2/3
11

3.4 MAIN BOARD ASSY (ATAPI) (3/3)

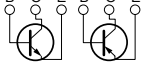
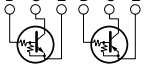
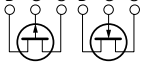
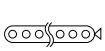
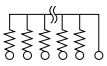



SP
SY
V+5P
(IC20)
TC7SU04FU
RCCLK
LSYNC
ASC
D50CNT
PAJI
PAJO
IC33
uPD65800GF-076-3B9
XRST
GNDA
DRAM (256k ×16)
DR
IC750 HM514260DLJ-6
GNDD
AGCRF
V+5A
V12DR
VRCCNT
VRC
IC51(1/2)
NJM2904M
Q46
2SC4081
V+6P
UDZ6.8B
IC30(1/2)
NJM2100M
DAO from M62A
ASC from IC33
PAJO from IC33
IC31(1/2)
TC7W08FU
IC51(2/2)
NJM2904M
IC30(2/2)
NJM2100M
IC31(2/2)
TC7W08FU
DT50 from CPU
D50B to IC200 (DV-IC)
VCO1 to M62A
DAO2 to CPU
SDATA
: SIGNAL ROUTE
CN700
(2/4)
CONFIGURATION JUMPER
IDMA
IDSL
IDCS
DSW0
DSW1
HCSEL
IDE I/F
CN700
(1/4)
LK-44104H-S1D1Z-2
ATAPI HOST INTERFACE
HRST
DMARQ
XIOW
XIOR
IORDY
XDMACK
INTRQ
XIOCS16
DA1
XPDIAG
DA0
DA2
XCS1
XCS3
XDASP
CN700
(4/4)
POWER
IC40
BA178M05FP
POWER SUPPLY

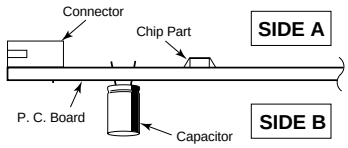
4. PCB CONNECTION DIAGRAM

NOTE FOR PCB DIAGRAMS:

1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

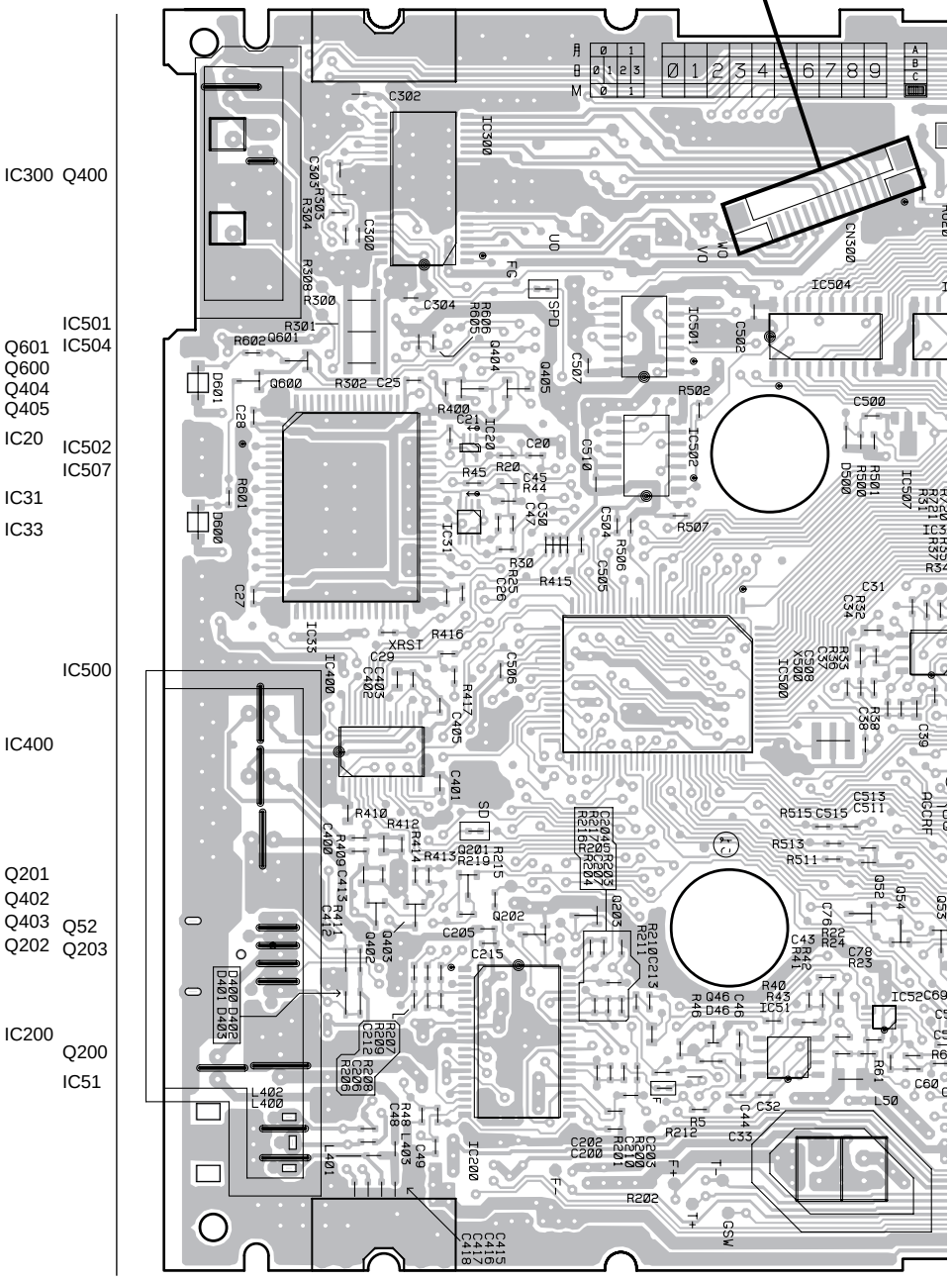
Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
		Transistor
		Transistor with resistor
		Field effect transistor
		Resistor array
		3-terminal regulator

3. The parts mounted on this PCB include all necessary parts for several destination.
   For further information for respective destinations, be sure to check with the schematic diagram.
4. Viewpoint of PCB diagrams

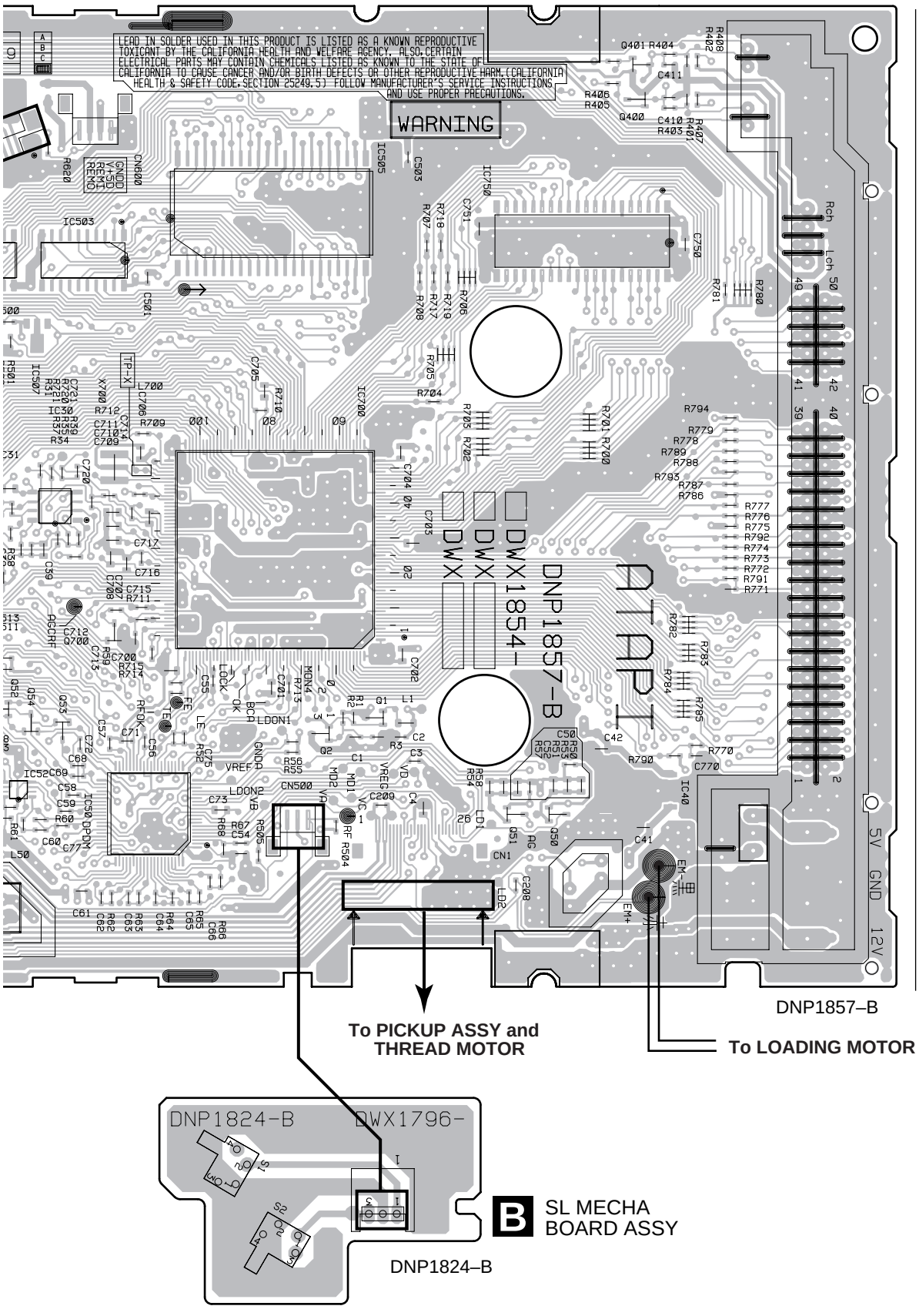


To SPINDLE MOTOR

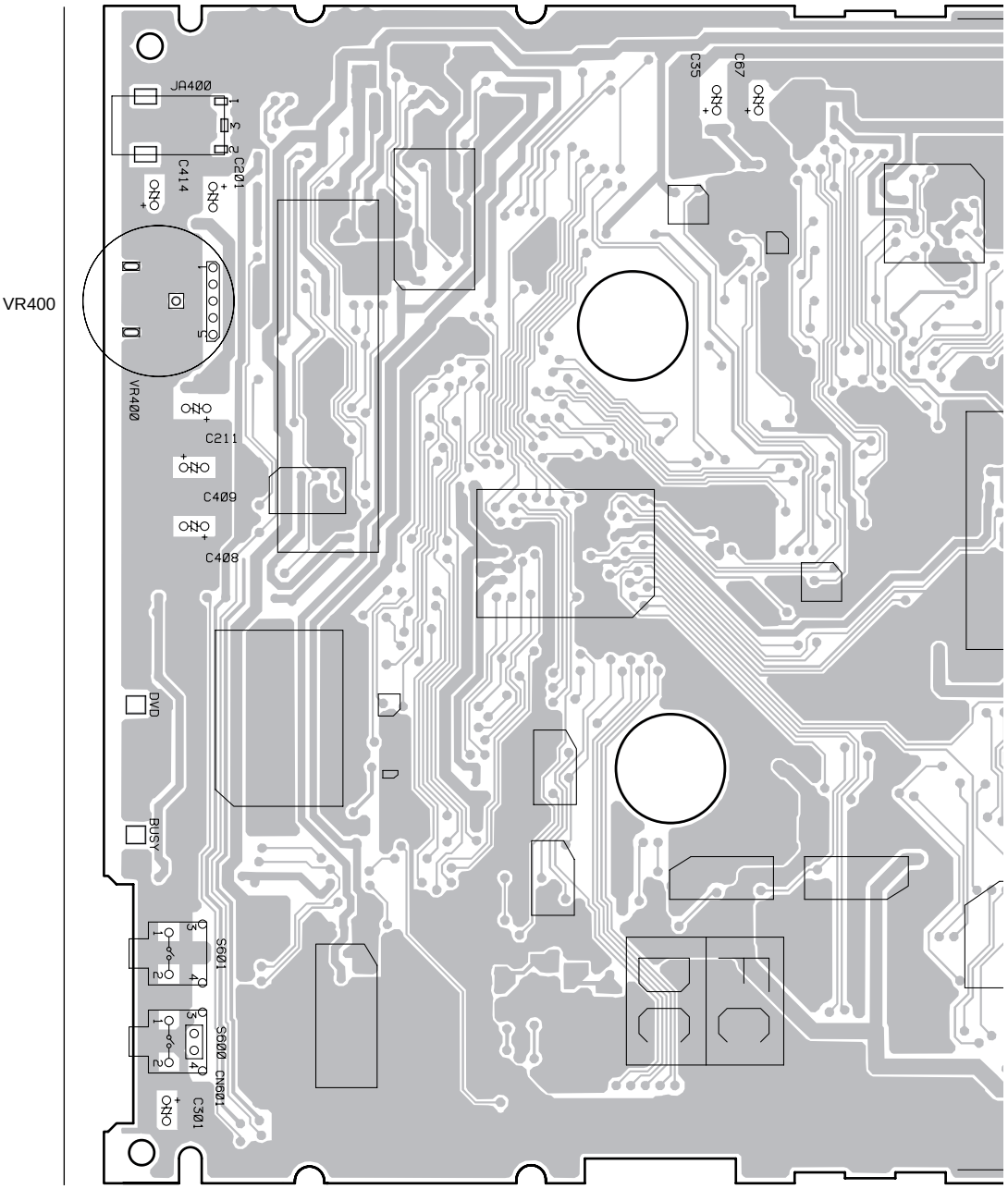
A MAIN BOARD ASSY (ATAPI)



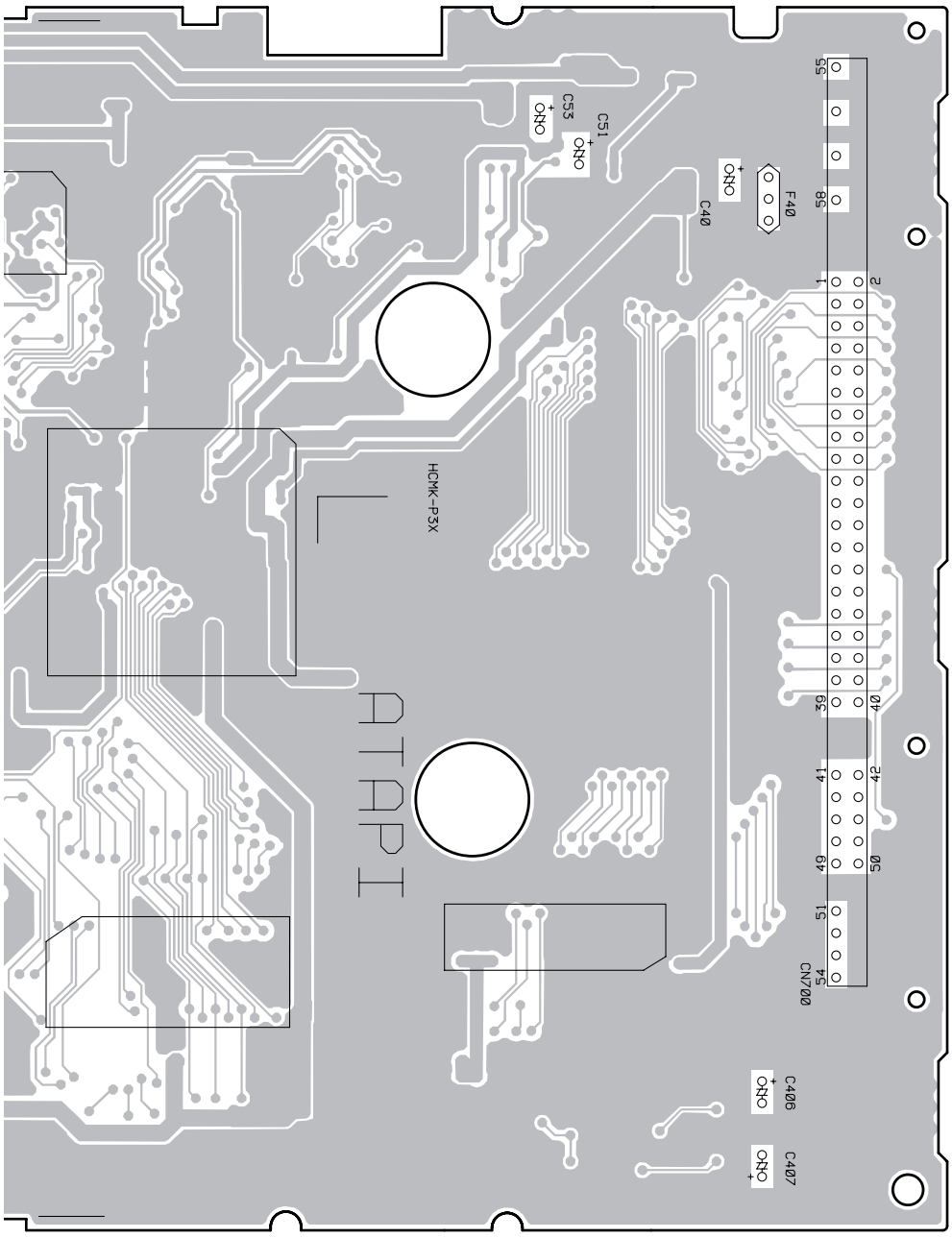
SIDE A


LEAD IN SOLDER USED IN THIS PRODUCT IS LISTED AS A KNOWN REPRODUCTIVE TOXICANT BY THE CALIFORNIA HEALTH AND WELFARE AGENCY. ALSO,CERTAIN ELECTRICAL PARTS MAY CONTAIN CHEMICALS LISTED AS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER AND/OR BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.(CALIFORNIA HEALTH & SAFETY CODE,SECTION 25249.5) FOLLOW MANUFACTURER'S SERVICE INSTRUCTIONS AND USE PROPER PRECAUTIONS.
WARNING
DNP1857-B
DWX1854-
DWX
DWX
PTRPT
DNP1824-B
DWX1796-
Q401
Q400
IC505
IC750
IC503
IC30
IC700
Q700
Q1
Q2
Q54
IC40
IC50
Q50
Q51
5V
GND
12V
To PICKUP ASSY and THREAD MOTOR
To LOADING MOTOR
DNP1857–B
DNP1824–B
B
SL MECHA BOARD ASSY

A MAIN BOARD ASSY (ATAPI)



SIDE B



DNP1857–B

5. PCB PARTS LIST

NOTES :
- *Parts marked by " NSP " are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex. 1 *When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).*

560 Ω → 56 × 10¹ → 561 ..... RD1/4PU 5 6 1 J
47k Ω → 47 × 10³ → 473 ..... RD1/4PU 4 7 3 J
0.5 Ω → R50 ..... RN2H R 5 0 K
1 Ω → 1R0 ..... RS1P 1 R 0 K

Ex. 2 *When there are 3 effective digits (such as in high precision metal film resistors).*

5.62k Ω → 562 × 10¹ → 5621 ..... RN1/4PC 5 6 2 1 F

Mark	No.	Description	Part No.

LIST OF PCB ASSEBLIES

	SL MECHA BOARD ASSY	DWX1796
	MAIN BOARD ASSY	DWX1854

A MAIN BOARD ASSY

SEMICONDUCTORS

	IC40	BA178M05FP
	IC300	BA6849FP
	IC750	HM514260DLJ-6
	IC200	M56759FP
	IC500	MB90T553PF
	IC51	NJM2904M
	IC30	NJM2100M
	IC400	PCM1719E
	IC505	PD6286A
	IC507	S-80742AN-D6
	IC501	TC74HC00AF
	IC502	TC74HC32AF
	IC503,IC504	TC74VHC373F
	IC31	TC7W08FU
	IC52	TC7W66FU
	IC50	UPC2510GK
	IC33	UPD65800GF-076
	IC700	UPD72152GD-LML
	Q2	2PB709A
	Q1	2PD601A
	Q50, Q51	2SA1036K
	Q400- Q403	2SC2411K
	Q46	2SC4081
	Q405,Q201	DTA124EK
	Q404,Q600,Q601,Q700	DTC124EK
	Q54	DTC144EK
	D500,D400-D403	1SS355
	D31	UDZ4.3B
	D46	UDZ6.8B
	D600	BG1111R
	D601	PY1111R

COILS AND FILTERS

	L1 (CHIP COIL)	DTL1058
	L700 (CHIP COIL)	DTL1067
	L50 (CHIP COIL)	OTL1009
	L400- L402 (CHIP SOLID INDUCTOR)	QTL1011
	F40 (EMI FILTER)	VTH1033

SWITCH

	S600	DSG1058

CAPACITORS

	C207, C210,C37,C48,C70	CCSRCH121J50
	C72	CCSRCH121J50
	C62-C66	CCSRCH151J50
	C770	CCSRCH181J50
	C714	CCSRCH220J50
	C69	CCSRCH390J50
	C716	CCSRCH821J25
	C35,C406,C407	CEAL100M6R3
	C408,C409,C414,C51	CEAL101M6R3
	C53,C67	CEAL220M6R3
	C211,C301	CEAL470M16
	C201	CEAL470M6R3
	C40	CEAT221M6R3
	C31,C34,C44,C45,C73	CKSQYB105K10
	C412,C413,C708	CKSQYB224K16
	C213	CKSQYB334K16
	C39,C4,C400-C402	CKSQYF105Z16
	C41,C42,C700-C707,C76	CKSQYF105Z16
	C709-C711,C717,C750,C751	CKSQYF105Z16
	C410,C411,C713,C46	CKSRYB102K50
	C68	CKSRYB103K50
	C2,C203,C204,C303,C43	CKSRYB104K16
	C500,C55-C57,C59,C71	CKSRYB104K16
	C77,C32,C209,C720,C721	CKSRYB104K16
	C30	CKSRYB123K50
	C715	CKSRYB152K50
	C206	CKSRYB222K50
	C712	CKSRYB223K25
	C302	CKSRYB393K16

Mark	No.	Description	Part No.
	C60		CKSRYB681K50
	C75		CKSRYB682K50
	C212		CKSRYB683K50
	C1,C200,C202,C205,C215		CKSRYF104K25
	C25-C28,C300,C304		CKSRYF104K25
	C33,C38,C403,C405		CKSRYF104K25
	C415-C418,C47,C49,C50		CKSRYF104K25
	C501-C508,C510,C511,C513		CKSRYF104K25
	C515,C52,C54,C58,C61		CKSRYF104K25
	C78		CKSRYF104K25

RESISTORS

	R300-R302	(1.0 Ω)	DCN1051
	R780	(10 kΩ)	DCN1094
	R415	(2.2 kΩ)	DCN1103
	R782-R785	(2 2 Ω)	DCN1104
	R50,R51,R53		RS1/10S360J
	R54, R57, R53		RS1/10S680J
	VR400 (10 kΩ)		DCP1086
	Other Resistor		RS1/16S □□□J

OTHERS

	CN300	FLEXIBLE CONNECTOR	52207-1490
	JA400	MINI JACK	DKN1146
	CN1	FLEXIBLE CONNECTOR	DKN1184
	X700	(16.934MHz)	DSS1097
	X500	(16 MHz)	DSS1098
	CN700	LK CONNECTOR(4IN1/AT)	LK-44104H-S
1D1Z			
	CN500	CONNECTOR 3P	S3B-ZR-SM3A

B SL MECHA BOARD ASSY

SWITCHES

	S1,S2		DSG1017

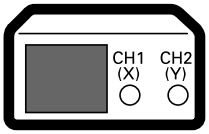
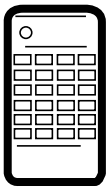
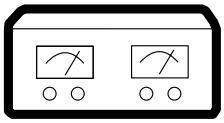
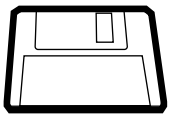
OTHERS

	CN 1	KR CONNECTOR	S3B-PH-K-S

6. ADJUSTMENT

6.1 PREPARATIONS

6.1.1 Jigs and Measuring Instruments

CD TEST DISC (CDT-304)	DVD TEST DISC GGV1018 (JK1)	⊖ screwdriver (small)	Desktop Personal Computer NEC PC98 Level or Windows 95... or Windows NT...	
 Dual-trace oscilloscope (10 : 1 probe)	 Test mode Remote Control Unit (RU-V101)	⊕ screwdriver (medium)	 DC Power Supply	 Check Programmed FD (ATAPI) 102_ CA.EXE

6.1.2 Necessary Check Points

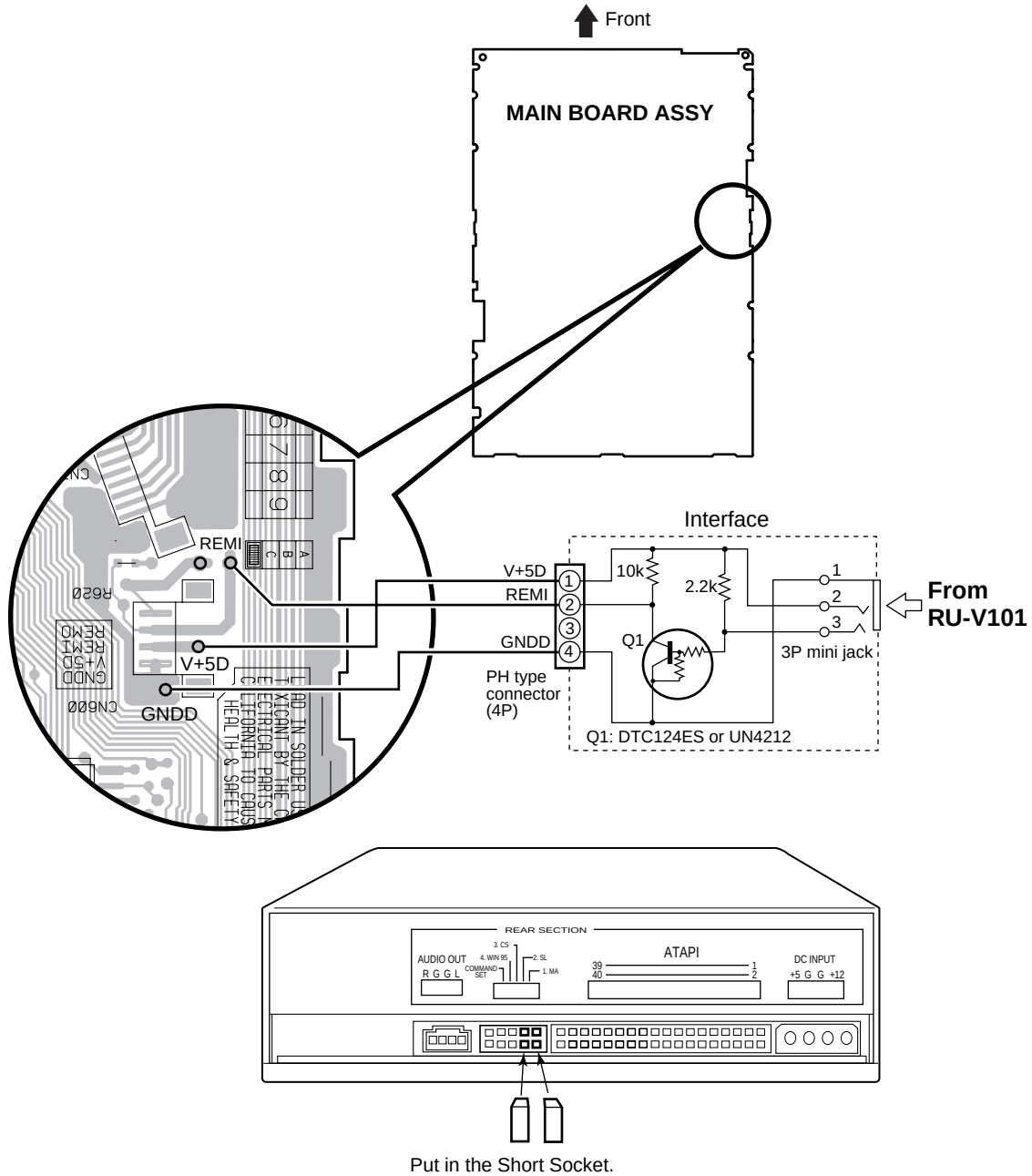
When	Check points
Exchange MAIN BOARD ASSY	Page 23
Exchange SERVO MECH ASSY	Page 23

6.2 TEST MODE

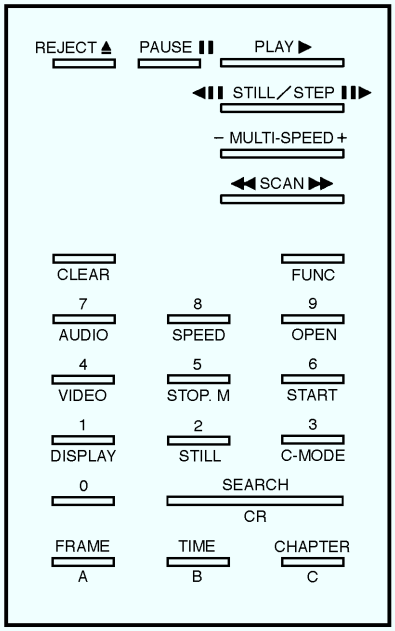
CAUTION-Laser radiation when open. **DO NOT STARE INTO BEAM.**

- When operating the DVD-ROM directly, it is possible to operate by connecting the RU-V101 to the DVD-ROM with the interface.
- When the test command is used, put in the short socket to MA and SL pins of pin header (CN700) on the rear panel, and turn the power on.

● Schematic Diagram of the Conversion Jig for Remote Control Operation



● Function Table of the Remote Controller (RU-V101) for Service



RU-V101

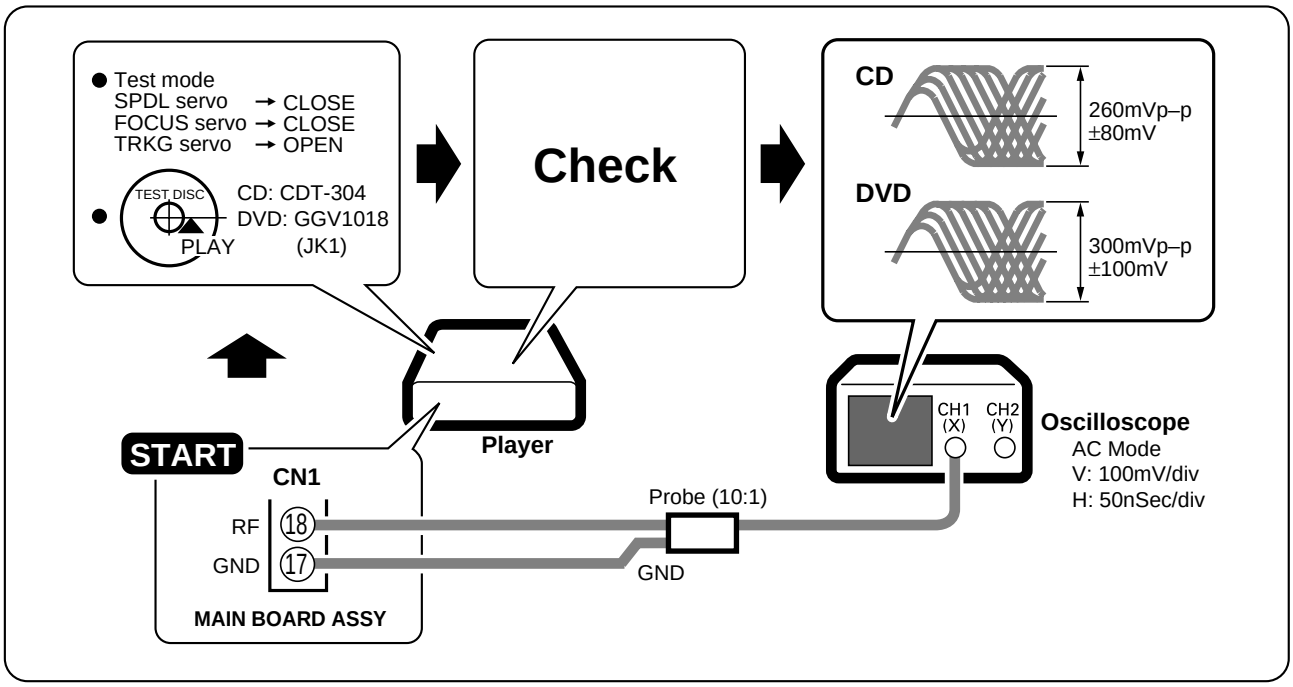
REJECT		: Spindle stop
PAUSE		: Pause
PLAY		: Play (Trace)
STILL/STEP	❚❚▶	: ⎫ Test command
STILL/STEP	◀❚❚	: ⎭
MULTI-SPEED +		: ⎫ Test command
MULTI-SPEED –		: ⎭
SCAN	▶▶	: No entry
SCAN	◀◀	: No entry
CLEAR		: Clear
FRAME		: Frame set
TIME		: Time set
CHAPTER		: Track set
SEARCH		: Search
10 key		: Numerical input
DISPLAY	(FUNC + 1)	: No entry
STILL	(FUNC + 2)	: No entry
C-MODE	(FUNC + 3)	: No entry
VIDEO	(FUNC + 4)	: No entry
STOP. M	(FUNC + 5)	: No entry
START	(FUNC + 6)	: Start
AUDIO	(FUNC + 7)	: No entry
SPEED	(FUNC + 8)	: No entry
OPEN	(FUNC + 9)	: Door open

● Test Command

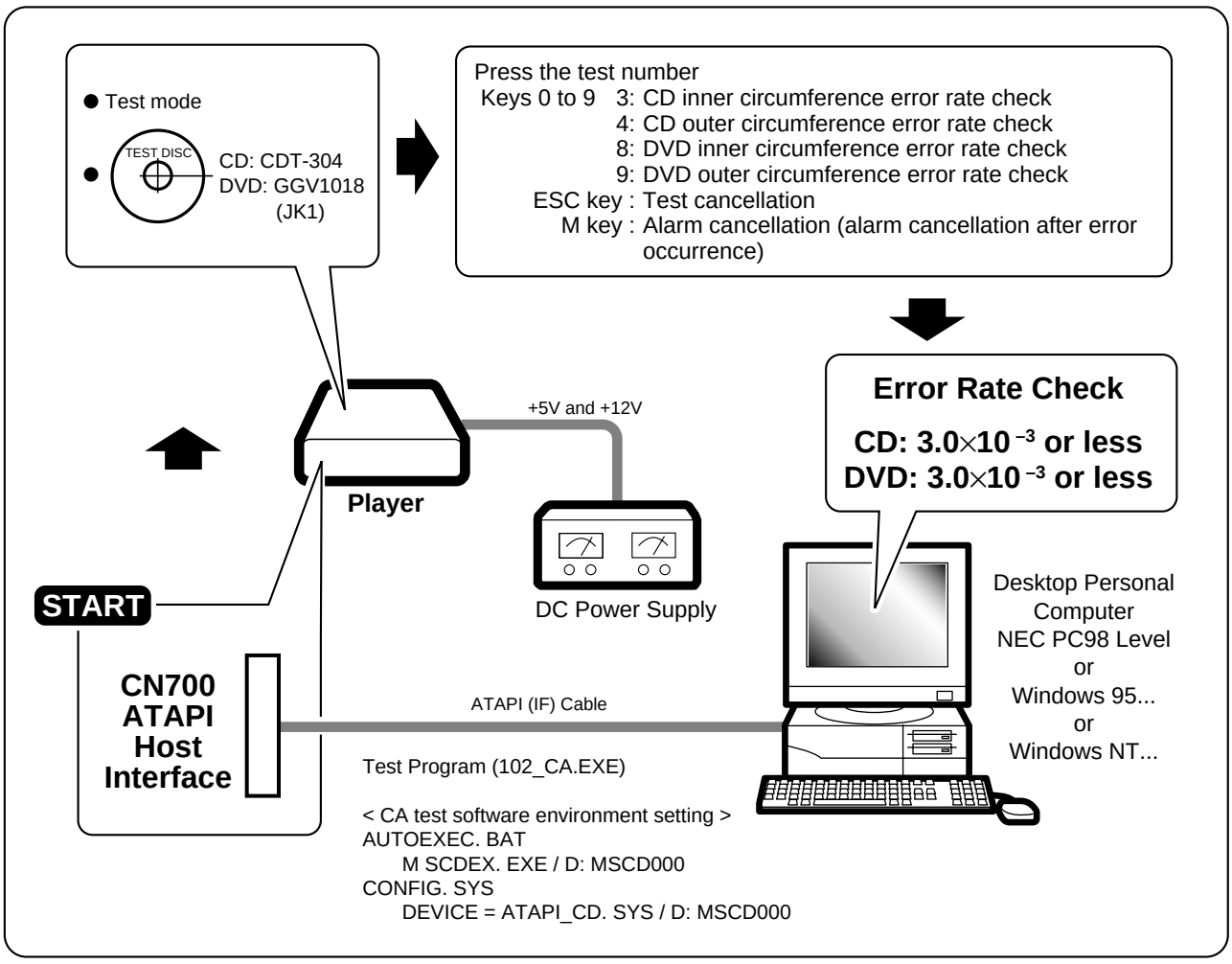
Key Operation	Command	Description
● CD Position		
[0] + [TIME]	{0TM}	All servo OFF
[1] + [TIME]	{1TM}	Laser-diode (LD) ON
[2] + [TIME]	{2TM}	Focus ON/OFF
[3] + [TIME]	{3TM}	Spindle ON
[4] + [TIME]	{4TM}	Tracking ON/OFF
[5] + [TIME]	{5TM}	PLL ON/OFF
[6] + [TIME]	{6TM}	Focus Up/Down
[8] + [TIME]	{8TM}	Spindle rotation control: CAV control
[9] + [TIME]	{9TM}	Spindle rotation control : CLV control
● DVD Position		
[1] + [0] + [TIME]	{10TM}	All servo OFF
[1] + [1] + [TIME]	{11TM}	Laser-diode (LD) ON
[1] + [2] + [TIME]	{12TM}	Focus Servo ON
[1] + [3] + [TIME]	{13TM}	Spindle FG ON
[1] + [4] + [TIME]	{14TM}	Tracking ON/OFF
[1] + [5] + [TIME]	{15TM}	Spindle PLL ON/OFF
[1] + [8] + [TIME]	{18TM}	Slider FWD move
[1] + [9] + [TIME]	{19TM}	Slider REV move
[3] + [3] + [TIME]	{33TM}	Focus Up/Down
[4] + [1] + [TIME]	{41TM}	Shock Sensor (OFF)
[4] + [3] + [TIME]	{43TM}	CD Position
[4] + [4] + [TIME]	{44TM}	DVD Position
[STILL/STEP >>]	{SF}	1 Track jump : FWD
[STILL/STEP <<]	{SR}	1 Track jump : REV
[*] + [*] + [*] + [MULTI-SPEED +]	{***MF}	*** Track jump : FWD
[*] + [*] + [*] + [MULTI-SPEED –]	{***MR}	*** Track jump : REV

Note: At the time of 1TM, 11TM, 33TM, the Laser diode will not light for 5 sec or more.

6.3 CD AND DVD RF LEVEL CHECK



6.4 ERROR RATE CHECK



7. GENERAL INFORMATION

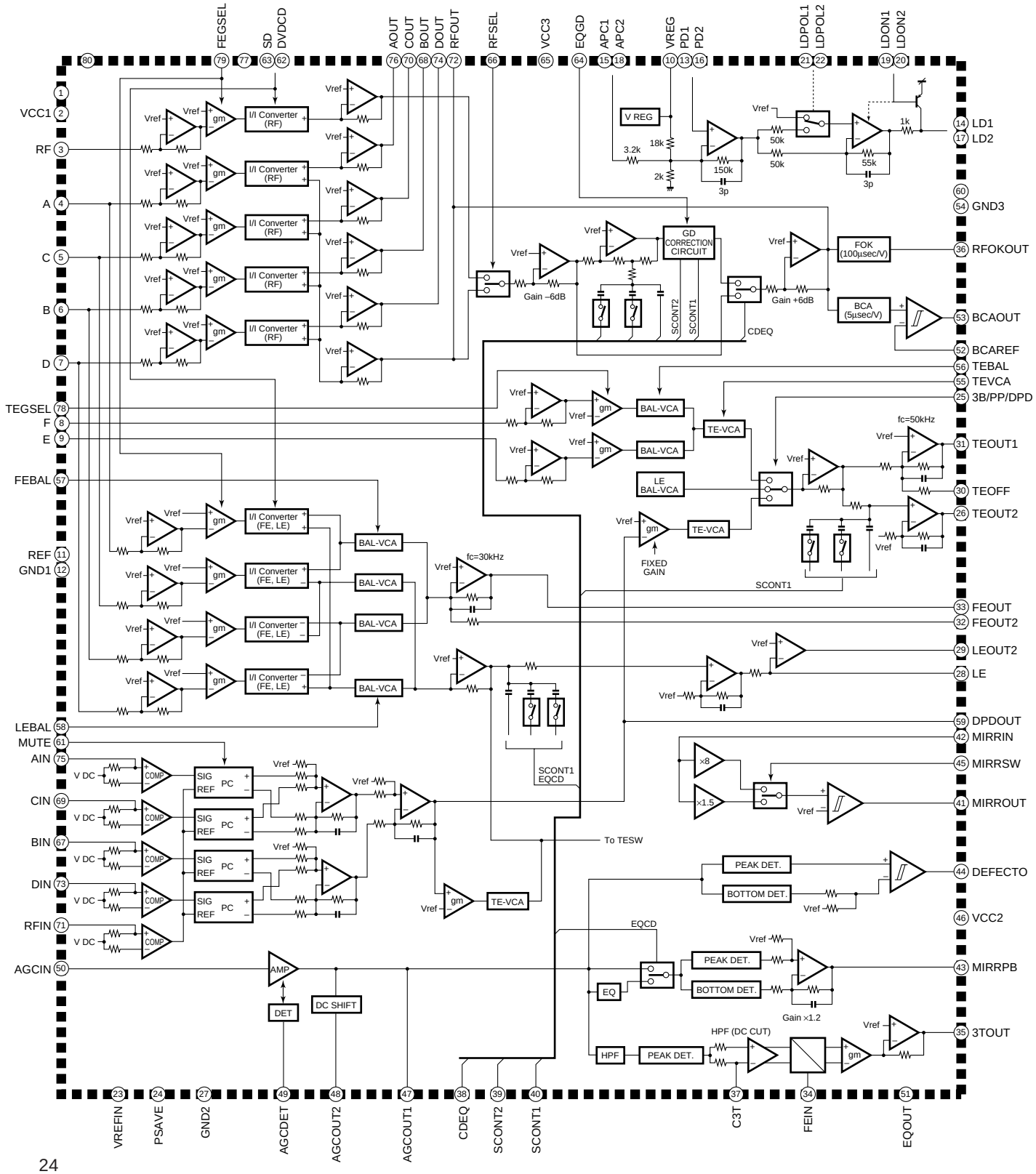
7.1 IC

- The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

■ μPC2510GK (IC50: MAIN BOARD ASSY)

• RF and Error Amplifier

• Block Diagram

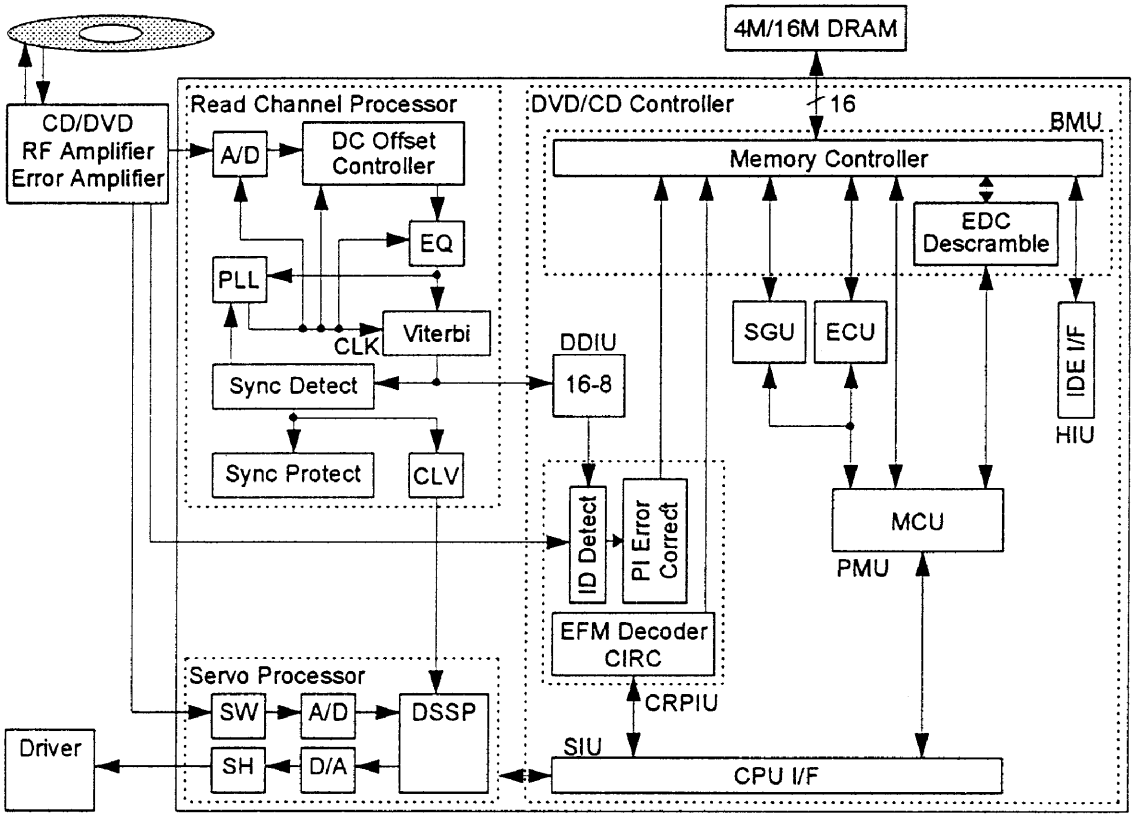


• RF and Error Amplifier

■ μPD72152GD (IC700: MAIN BOARD ASSY)

• CD-ROM and DVD ROM Controller

• Block Diagram



• Pin Function

No.	Name	I/O	Description
1	GND	–	Digital GND
2	IORDY	O	I/O Channel ready signal output
3	$\overline{\text{DIOR}}$	I	Read control signal input
4	VDD	–	+5V Digital Power Supply
5	$\overline{\text{DIOW}}$	I	Write control signal input
6	HDMARQ	O	I/O DMA request signal output (3 states)
7	HDD15	I/O	IDE data bus signal input/output terminal
8	HDD0		
9	VDD	–	+5V Digital Power Supply
10	HDD14	I/O	IDE data bus signal input/output terminal
11	HDD1		
12	HDD13		
13	HDD2		
14	HDD12		

No.	Name	I/O	Description
15	GND	–	Digital GND
16	HDD3	I/O	IDE data bus signal input/output terminal
17	HDD11		
18	HDD4		
19	HDD10		
20	HDD5		
21	VDD	–	+5V Digital Power Supply
22	HDD9	I/O	IDE data bus signal input/output terminal
23	HDD6		
24	HDD8		
25	GND	–	Digital GND
26	HDD7	I/O	IDE data bus signal input/output terminal
27	$\overline{\text{HRESET}}$	I	Reset input signal (3 states)
28	GND	–	Digital GND

µPD72152GD

No.	Name	I/O	Description
29	VDD	–	+5V Digital Power Supply
30 | 35	MD15 | MD10	I/O	16 bit data input/output for buffer memory
36	GND	–	Digital GND
37 | 42	MD9 | MD4	I/O	16 bit data input/output for buffer memory
43	VDD	–	+5V Digital Power Supply
44 | 47	MD3 | MD0	I/O	16 bit data input/output for buffer memory
48	MA11	O	Address output to buffer memory
49	GND	–	Digital GND
50	MA10	O	Address output to buffer memory
51	MA9		
52	GND	–	Digital GND
53	GND		
54	MA8	O	Address output to buffer memory
55	MA7		
56	VDD	–	+5V Digital Power Supply
57 | 60	MA6 | MA3	O	Address output to buffer memory
61	VDD	–	+5V Digital Power Supply
62 | 64	MA2 | MA0	O	Address output to buffer memory
65	$\overline{OE}$	O	Connect to $\overline{OE}$ signal of DRAM
66	$\overline{WE}$	O	Connect to $\overline{WE}$ signal of DRAM
67	$\overline{RAS}$	O	$\overline{RAS}$ signal output
68	GND	–	Digital GND
69	$\overline{UCAS}$	O	$\overline{UCAS}$ signal output
70	$\overline{LCAS}$	O	$\overline{LCAS}$ signal output
71	INT2	O	Servo I/F-related interrupt
72	INT1	O	Host I/F-related interrupt
73	GND	–	Digital GND
74	INT0	O	Interrupt request output other than servo I/F, host I/F
75	READY	O	Wait signal put out to the local CPU at the time of buffer memory access
76	GND	–	Digital GND
77	$\overline{WR}$	I	Write control signal from Local CPU
78	$\overline{RD}$	I	Read control signal from Local CPU
79	$\overline{SYSRST}$	I	µPD72152 reset input
80	$\overline{CS}$	I	Chip select signal from the local CPU to the internal register, buffer memory
81	$\overline{UBE}$	I	Significant byte access control signal
82	ASTB	I	Input signal for address latch

No.	Name	I/O	Description
83	GND	–	Digital GND
84	AD15	I/O	Address/Data time interrupt output signal AD15 = MSB
85	AD14		
86	VDD	–	+5V Digital Power Supply
87 | 90	AD13 | AD10	I/O	Address/Data time interrupt output signal
91	VDD	–	+5V Digital Power Supply
92 | 97	AD9 | AD4	I/O	Address/Data time interrupt output signal
98	GND	–	Digital GND
99	GND		
100 | 103	AD3 | AD0	I/O	Address/Data time interrupt output signal AD0 = LSB
104	GND	–	Digital GND
105	GND		
106	RCCLK	I/O	Bit clock monitoring terminal
107	RCDATA	I/O	NAZ after bit clock synchronization [data monitoring terminal, CD: EFM, DVD: (8.16) output]
108	XVDD	–	+5V Digital Power Supply
109	XTAL	I	Connect to Crystal resonator
110	XGND	–	Digital GND
111	$\overline{XTAL}$	O	Connect to Crystal resonator
112	VDD	–	+5V Digital Power Supply
113	TCKLIN	I	Test terminal (Normally "L")
114	GND	–	Digital GND
115	CPLCK	O	Slice method bit clock monitoring terminal
116	CKGCK	O	Clock generator clock monitoring terminal
117	VDD	–	+5V Digital Power Supply
118 | 123	ADDT0 | ADDT5	I	Input terminal at the time of RF signal external ADC correspondence
124	GND	–	Digital GND
125	VDD	–	+5V Digital Power Supply
126	AVDD	–	+5V Analog Power Supply
127	SDATA	I	Read channel RF signal input terminal
128	AGND	–	Analog GND
129	AGND		
130	VRT	I	Read channel ADC high-potential reference voltage
131	VRC	I	Read channel ADC medium-potential reference voltage
132	VRB	I	Read channel ADC low-potential reference voltage
133	AVDD	–	+5V Analog Power Supply
134	AGND	–	Analog GND
135	TSTEFM	I	Test terminal (Normally "L")

µPD72152GD

No.	Name	I/O	Description
136	LPFEFM	I/O	Test terminal
137	AVDD	–	+5V Analog Power Supply
138	MDRY	O	Spindle drive output
139	SD	O	Thread drive output
140	TD	O	Tracking drive output
141	FD	O	Focus drive output
142	LEBAL	O	Lens error balance adjustment output
143	FBAL	O	Focus balance adjustment output
144	TBAL	O	Tracking balance adjustment output
145	TEVCA	O	Tracking gain adjustment output
146	AGND	–	Analog GND
147	RFI	I	RF signal input terminal to the EFM comparator
148	AVDD	–	+5V Analog Power Supply
149	ASY	I	EFM comparator level input
150	AGND	–	Analog GND
151	EFM	O	EFM signal output
152	AGND	–	Analog GND
153	HOLD	I	HOLD control signal input
154	MIRR	I	MIRR detection signal input
155	AVDD	–	+5V Analog Power Supply
156	AGND	–	Analog GND
157	RFOK	I	RF signal input terminal for RFOK signal generation
158	VR1	I	A/D converter input
159	FE	I	Focus error signal input
160	TE	I	Tracking error signal input
161	LE	I	Lens error signal input
162	VR2	I	A/D converter input
163	AVDD	–	+5V Analog Power Supply
164	TEC	I	Tracking comparator input
165	REFOUT	O	A/D converter neutral point potential output
166	AGND	–	Analog GND
167	LPFCK	I/O	Test terminal (Normally OPEN)
168	N.C.	–	Not connect
169	AVDD	–	+5V Analog Power Supply
170	VDD	–	+5V Digital Power Supply
171	VDD	–	
172	FG	I	FG signal input
173	LOCK	O	Output of “H” when the sync pattern detection signal and the frame counter output coincide at the time of EFM demodulation, and output of “L” when they do not coincide
174	SLED2	I	Thread position sensor input
175	SLED1		

No.	Name	I/O	Description
176	RFOKOUT	O	RFOK signal output
177	GND	–	Digital GND
178	XTLE	I	Test terminal (Normally "H")
179	GND	–	Digital GND
180	N.C.	–	Not connect
181	N.C.		
182	VDD	–	+5V Digital Power Supply
183	BCADAT	I	BCAsignal input
184	BCAEN	O	BCA read control signal output
185	GND	–	Digital GND
186	BCLK	O	Serial audio data transmission clock output
187	LRCK	O	Serial audio data L/R Channel discrimination signal output
188	SO	O	Serial audio data signal output terminal Changes synchronized to BCLK ↓.
189	GND	–	Digital GND
190	GND		
191	MON4	O	Mode1: LOCK Output of “H” when the sync pattern detection signal and the frame counter output coincide at the time of EFM demodulation, and output of “L” when they do not coincide
			Mode2: ILLPIO Indicates PIO transfer by the host during DMA transfer. Status occurrence with “H”.
			Mode3: NREG [2] Signal indicating the number of errors on one line
			Mode6: DVDSYNC1 Signal indicating the SYNC0-SYNC7 number
192	MON3	O	Mode1: ERCK ERO output clock
			Mode3: NREG [1] Signal indicating the number of errors on one line
			Mode6: DVDSYNC0 Signal indicating the SYNC0-SYNC7 number
193	MON2	O	Mode1: ERO Signal indicating the CIC2 error information
			Mode2: IORDYER Indicates that $\overline{\text{DIOW}}$/$\overline{\text{DIOR}}$ has become high level while the IORDY signal was low level. Status occurrence with “H”.
			Mode3: NREG [0] Signal indicating the number of errors on one line
			Mode6: SYNCFAIL Signal indicating that SYNC has not been detected

μPD72152GD

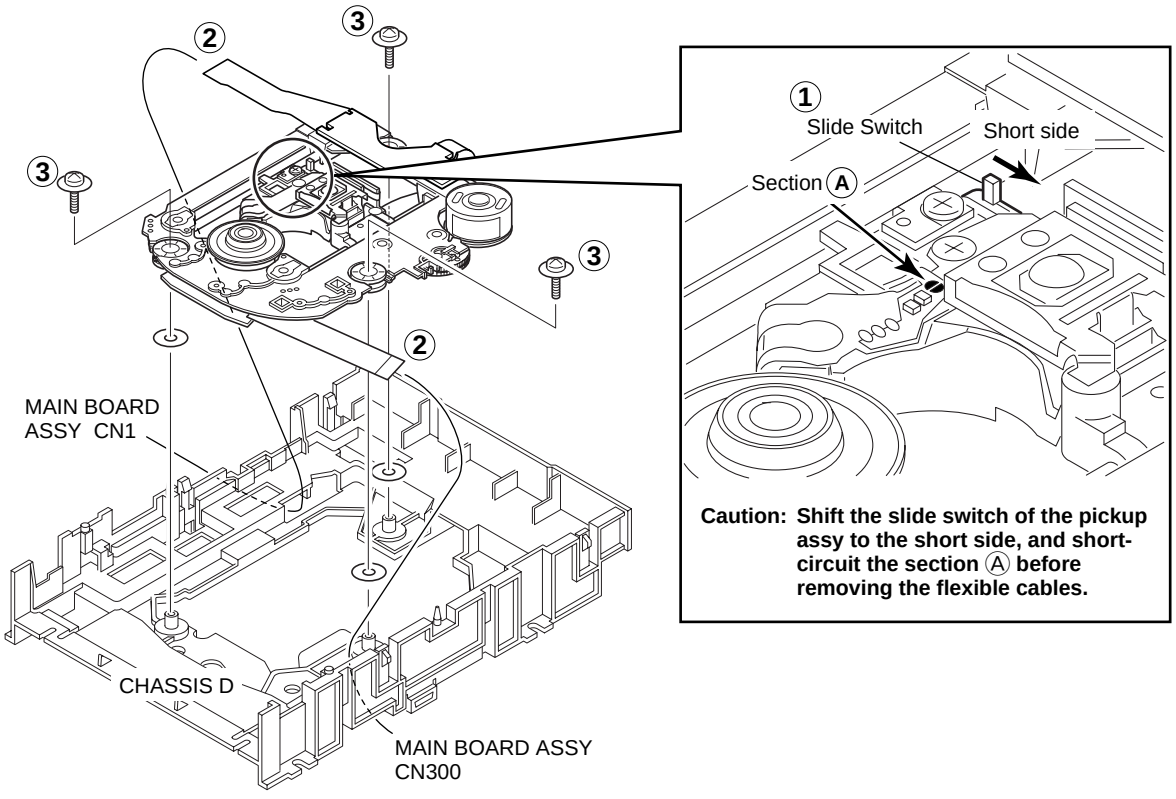
No.	Name	I/O	Description
194	MON1	O	Mode1: RFCK Signal indicating the cycle for one frame/line at the time of CD/DVD
			Mode2: FUNRER "H" indicates that an overrun has occurred for the HIU FIFO.
			Mode6: SYNCCMP Interpolated SYNC detection signal. At the time of CD: SYNC miss, DVD: SYNC interpolation
195	MON0	O	Mode1: EMPH Emphasis identification signal
			Mode2: FOVRER "H" indicates that an overrun has occurred for the HIU FIFO.
			Mode6: SYNCDET SYNC detection signal (CD/DVD)
196	HIFSEL	I	Host interface selection signal L: IDE interface H: General DMA interface

No.	Name	I/O	Description
197	$\overline{\text{DASP}}$	I/O	Device active and device 1 present signal for IDE control bus
198	VDD	–	+5V Digital Power Supply
199	$\overline{\text{HCS1}}$	I	Control Block Register select signal for Task Register File
200	$\overline{\text{HCS0}}$	I	Command Block Register select signal for Task Register File
201	HDA2	I	IDE address bus input signal
202	HDA0		
203	$\overline{\text{PDIAG}}$	I/O	Passed diagnostics signal output terminal to the IDE controller bus
204	HDA1	I	IDE address bus input signal
205	$\overline{\text{HIOCS16}}$	O	16 bit I/O output signal to the host
206	HINTRQ	O	Interrupt request signal to the host (3 states)
207	$\overline{\text{HDMACK}}$	I	DMA response signal to the host. Indicates that a request for a DMA transfer has been received.
208	GND	–	Digital GND

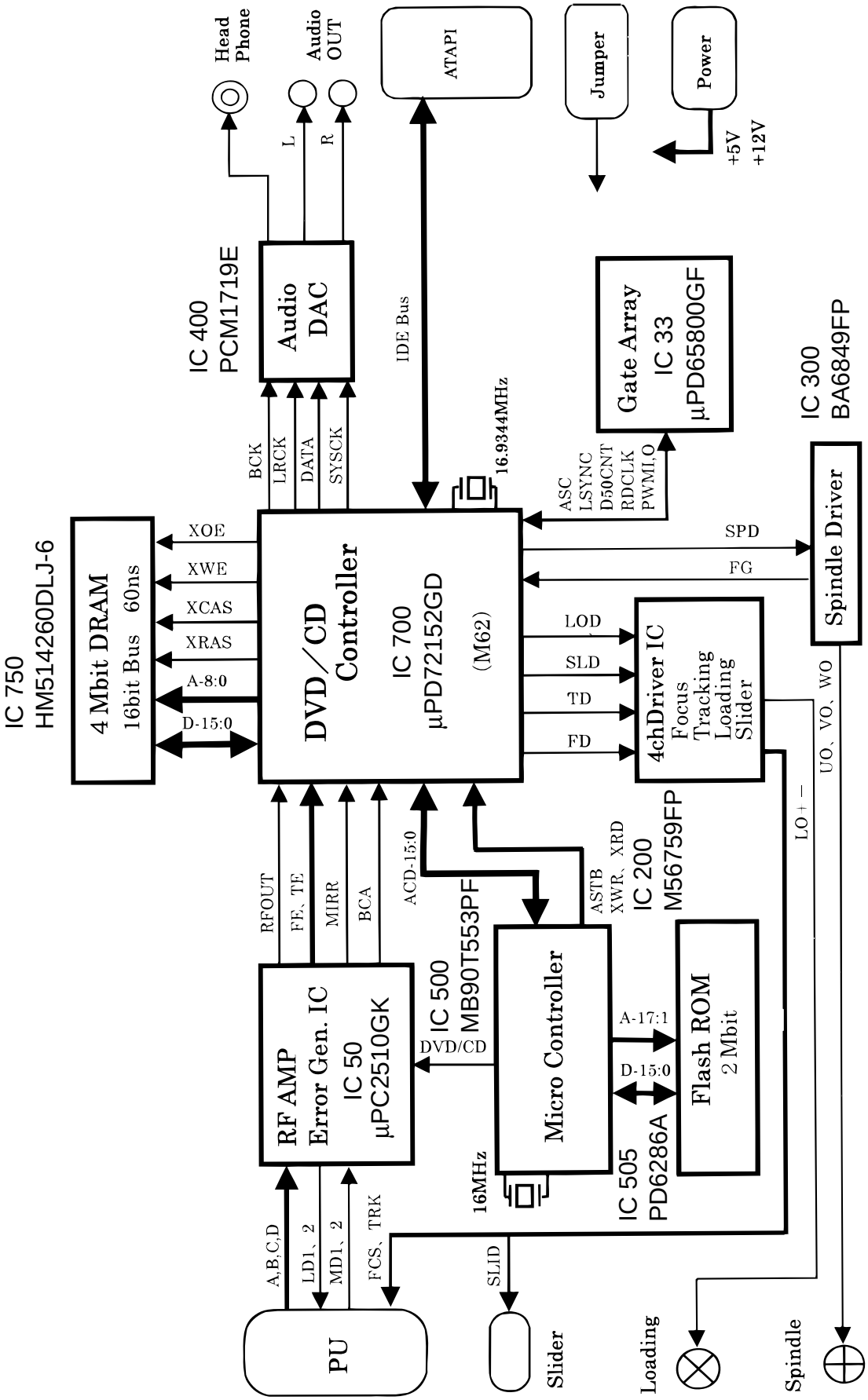
7.2 DISASSEMBLY

■ Remove the Servo Mechanism Assy

① Shift the slide switch to short side and short-circuit the section Ⓐ.
② Remove the two flexible connectors (CN1 and CN300).
③ Remove three screws.



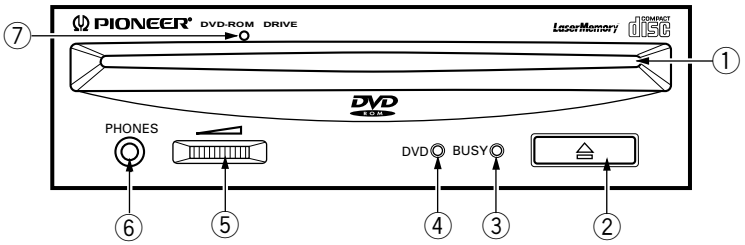
7.3 BLOCK DIAGRAM



8. PANEL FACILITIES AND SPECIFICATIONS

■ PANEL FACILITIES

● FRONT VIEW for DVD-A02



① Disc loading slot

Insert the DVD-ROM or CD-ROM with the label facing up.

Precautions on Playing 8 cm/3-inch Discs

- *When playing 8 cm/3-inch discs, always use the adapter for 8 cm/3-inch discs. Before loading the disc into the DVD-ROM drive unit, be sure to check that it is secured properly by the catches of the adapter. If discs have been inserted without the adapter by mistake, remove the disc immediately by pressing the eject button. If the disc does not come out with one press, press another time.*
- *Use 8 cm/3-inch disc adapters labeled with the mark (recommended standard product). Do not use adapters which cause the disc to idle, nor adapters which are bent or curved.*

② Eject (⏏) button

This button is used to eject the disc.

③ BUSY indicator

Flashes during data access.

④ DVD indicator

Lights when a DVD is loaded.

⑤ Volume Control (headphone level)

This is used to adjust the volume level of the headphone jack.

⑥ Headphone jack (PHONES)

This is a stereo minijack for headphones.

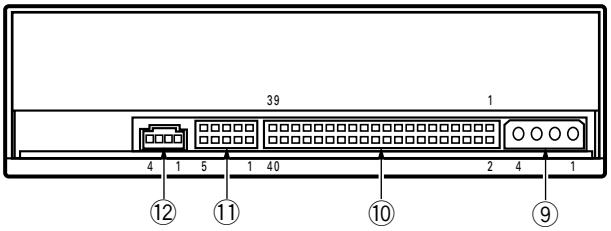
⑦ Hole for forced ejection

When the eject button has lost its function, insert an accessory pin for emergency ejection into this hole and push to eject the disc.

WARNING:

- Before executing this operation, be sure to switch off the powe supply of the computer and confirm that the disc loading is stopped.
  It takes approx. 30 seconds to stop loading a disc after switching off the power supply.
- Always use the pin provided (Do not use other objects).

REAR VIEW



⑨ DC Input

This is the power supply input for DC +5 V and +12 V.

Pin	Name	Function
1	+12	Power supply input for DC +12 V.
2	G	Ground.
3	G	Ground.
4	+5	Power supply input for DC +5 V.

⑩ Host IDE Interface

This is a 40 pin I/O connector according to the ATA specifications.

⑪ Device Configuration Jumper

This is the jumper switch for selection of the drive use mode and supporting PC.
Short-circuit socket is attached for the setting
attached : on not attached : off

Pin	Name		Function
1	MA*1	on	The drive is used in master mode.
2	SL	on	The drive is used in slave mode.
3	CS	on	Mode for drive setting by CSEL of the IDE interface.
4			Reserved
5	RPC	on	Stay in RPC Phase I mode
	SET*1 *2	off	Start RPC Phase II mode (Never return to Phase I mode after Phase II mode is used.)

*1 Pin 1 (MA) and Pin 5 (PRC SET) are ON at the time of shipping from the plant.

*2 For a DVD Video playback system (computer) for Phase I, please use with Phase I. When the DVD VideoÅ playback system (computer) and the drive have different region codes, DVD Video playback is not possible.
Set the jumper switch to OFF only when use of a drive corresponding to Phase II has been specified clearly for the DVD Video playback system (computer). DVD-102 will be initalzed automatically and will operate in Phase II mode.

⑫ Audio Output (AUDIO OUT)

This is a connector for output of analog audio.
As a Molex 70553 type connector is used,select a match-ing connection cable.

Pin	Name	Function
1	L	Left channel audio output.
2	G	Ground.
3	G	Ground.
4	R	Right channel audio output.

■ SPECIFICATIONS

[General functions]

Disc diameter		12 cm (4.72 in), 8 cm (3.15 in)*
* *When using 8 cm discs, attach a CD adapter (available at stores) to the disc.*		
Transfer rate (Sustained)		
DVD-ROM	MAX	3,300 kBytes/sec.
CD-ROM	MAX	3,000 kBytes/sec*
* *The data transfer rate may not be output for some disc conditions (scratches, etc.).*		
Access time (Random average)		
DVD-ROM		150 ms
CD-ROM		90 ms
Data buffer capacity		512 kBytes

[Audio output part]

Line	0.7 Vrms ± 0.5 Vrms (at 10 kΩ load)

[Others]

Power supply	DC +12 V, 1.0 A (peak), 0.5 A (normal)
	DC +5 V, 2.0 A (peak), 1.0 A (normal)
External dimensions (except front panel)	148 (W) x 42.3 (H) x 208.5 (D) mm
	5-27/32 (W) x 1-11/16 (H) x 8-7/32 (D) in
Weight	1.0 kg (2.2 lb)
Operation temperature	+ 5°C to +45°C (41°F to 113°F)
Operation humidity	5% to 85% (no condensation)
Storage temperature	– 40°C to +60°C (–40°F to 140°F)
Storage humidity	5% to 90% (no condensation)

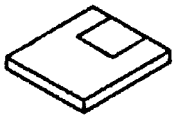
[Accessories]

- Software device drive disk x 1
- Short-circuit socket x 2
- Audio cable x 1
- Mounting screw x 4
- Pin for emergency ejection x 1
- Operating instructions x 1
- Installation instructions x 1

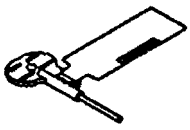
NOTE:

Specifications and design subject to possible modifications without notice, due to improvements.

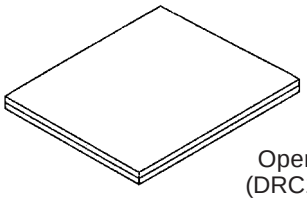
Accessories



Software device drive disk
(DWX1808: DVD-A02 only)

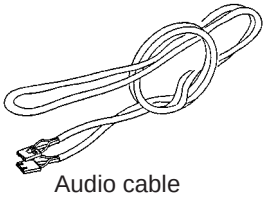


Pin for emergency ejection
(DEX1007)

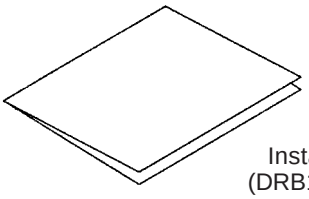


Operating instructions
(DRC1068: for DVD-102)
(DRC1074: for DVD-A02)

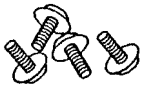
Short-circuit socket
(DKX1042: DVD-A02 only)



Audio cable
(L=0.6m)
(DKP3369: DVD-A02 only)



Installation instructions
(DRB1225: DVD-A02 only)



Mounting screw
(AMZ30P060FMC: DVD-A02 only)